







Columbia-Presbyterian Medical Center

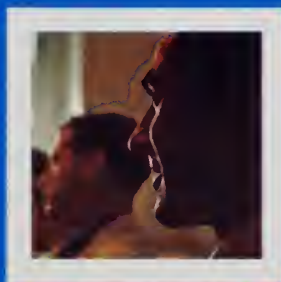
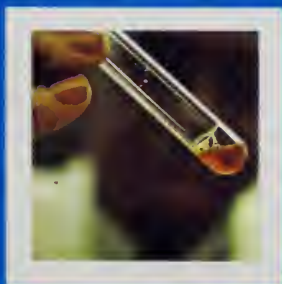
COLLEGE OF PHYSICIANS AND SURGEONS
Columbia University in the City of New York

THE PRESBYTERIAN HOSPITAL
in the City of New York

SCHOOL OF DENTAL AND ORAL SURGERY
Columbia University in the City of New York



PATIENT CARE
MEDICAL EDUCATION
MEDICAL RESEARCH



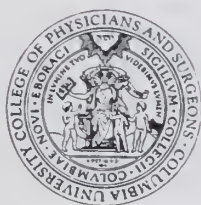


Digitized by the Internet Archive
in 2016

https://archive.org/details/combinedannualre00colu_4

FOURTEENTH COMBINED ANNUAL REPORT
of the
COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York, N. Y. 10032



College of Physicians and Surgeons • Columbia University
in the City of New York

The Presbyterian Hospital in the City of New York

and

School of Dental and Oral Surgery • Columbia University
in the City of New York

December 31, 1972

Serial
C
Spec-611
H-611

This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who through their training are preparing to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 7,500 people who serve and study within the Hospital and College, who give life and breath to this concept.

"Those who serve" include every worker — professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

Gifts and Bequests

The activities of the Medical Center are supported to a substantial extent by the income from bequests of friends who desire to insure the continuation of their help to the sick.

Depending upon the wishes of the donor or the objects and purposes of the gift, gifts or bequests may be made to any one of the following:

Columbia-Presbyterian Medical Center Fund, Inc.

The Trustees of Columbia University in the City of New York for the use of its College of Physicians and Surgeons.

The Presbyterian Hospital in the City of New York.

Bequests may be made in the following form:

Form of Bequest *I give and bequeath to _____ the sum of _____ dollars (\$ _____) to be applied to the use and benefit of said corporation, under the direction of the Trustees thereof.*

In case it is desired to specify the particular use to which the bequest is to be put, such use may be specified in place of the words "*to be applied to the use and benefit of the said corporation, under the direction of the Trustees thereof.*" in the form of bequest given above.

In case it is desired to make the bequest as a memorial, "*in memory of _____*" may be added to the form of bequest.

The Presbyterian Hospital in the City of New York, by reason of the consolidation of its constituent hospitals at the Medical Center, will receive gifts made to The Presbyterian Hospital in the City of New York, to the Babies Hospital of the City of New York, to Neurological Institute of New York and to New York Orthopaedic Dispensary and Hospital. It is, therefore, not necessary to change the provision of any will naming any of the foregoing constituent hospitals as a beneficiary. Of course, a gift or bequest to The Presbyterian Hospital in the City of New York may specify that it is to be used for the benefit of any one of the foregoing constituent hospitals or for any other purpose.

Columbia University's College of Physicians and Surgeons including its School of Nursing and School of Public Health encompass a variety of teaching and research programs. A gift or bequest to the College of Physicians and Surgeons may specify that it is to be applied to any one of the many programs mentioned in the body of the report or for general educational and research purposes of the College of Physicians and Surgeons.

Contents

ORIGIN AND FUNCTIONS OF THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER.....	iii	REPORTS OF WOMEN'S AUXILIARIES	
REPORT OF THE CHAIRMAN OF THE BOARD		THE PRESBYTERIAN HOSPITAL IN THE CITY OF	
THE PRESBYTERIAN HOSPITAL IN THE CITY OF		NEW YORK	227
NEW YORK	1	Board of Women Managers, Babies Hospital..	228
REPORT OF THE PRESIDENT OF THE MEDICAL BOARD		Cribside Social Service Committee.....	230
THE PRESBYTERIAN HOSPITAL IN THE CITY OF		Neurological Institute Auxiliary.....	231
NEW YORK	5	Women's Auxiliary of the New York	
REPORT OF THE VICE PRESIDENT IN CHARGE OF		Orthopaedic Hospital	233
MEDICAL AFFAIRS AND THE DEAN OF THE FACULTY		Women's Auxiliary of the	
OF MEDICINE		Presbyterian Hospital	234
COLLEGE OF PHYSICIANS AND SURGEONS.....	8	TRUSTEES AND COMMITTEES.....	237
REPORTS OF DEPARTMENTS AND SERVICES.....	27	Trustees of	
Anatomy	28	Columbia University in the	
Anesthesiology	33	City of New York	238
Biochemistry	39	Joint Administrative Board.....	239
Dermatology	44	Trustees of	
Human Genetics and Development.....	47	Columbia-Presbyterian Medical Center Fund,	
Medicine	52	Inc.	239
Microbiology	67	Trustees and Officers of	
Neurological Surgery	74	The Presbyterian Hospital in the	
Neurology	78	City of New York.....	240
Nursing	87	Committees of the Board of Trustees....	242
Obstetrics and Gynecology	91	Medical Board	242
Ophthalmology	100	THE PRESBYTERIAN HOSPITAL IN THE CITY OF	
Orthopaedic Surgery	107	NEW YORK	245
Otolaryngology	113	Women's Auxiliaries	246
Pathology	116	Members of the Corporation.....	249
Pediatrics	125	Administrative Staff	251
Pharmacology	132	PROFESSIONAL STAFF	
Physiology	141	THE PRESBYTERIAN HOSPITAL IN THE CITY OF	
Psychiatry	145	NEW YORK	253
Public Health	155	Consultants	254
Radiology	165	Chiefs of Clinics.....	265
Rehabilitation Medicine	171	FACULTY OF MEDICINE	
Surgery	175	COLLEGE OF PHYSICIANS AND SURGEONS	
Urology	184	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	267
International Institute for the Study of		Officers of the Faculty of Medicine.....	268
Human Reproduction	190	Executive Committees of the Faculty.....	268
Institute of Cancer Research	197	Faculty Council of the Faculty of Medicine...	268
Institute of Comparative Medicine.....	203	Academic Committees	269
Institute of Human Nutrition	204	Joint Committees of Faculty of Medicine	
Medical Library	208	and Professional Staff	
Center for Community Health Systems.....	211	of Presbyterian Hospital.....	270
REPORT OF THE DEAN OF THE FACULTY OF		SCHOOL OF DENTAL AND ORAL SURGERY	
DENTAL AND ORAL SURGERY.....	217	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	271
DENTAL AND ORAL SURGERY.....	220	Officers of the Faculty.....	271
REPORT OF THE		Academic Committees	271
PUBLICATIONS OF MEMBERS OF THE DENTAL		ACADEMIC STAFF	
PROFESSIONAL AND ACADEMIC STAFFS.....	224	COLLEGE OF PHYSICIANS AND SURGEONS	
		COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	273
		Emeritus Officers	274

Contents—Continued

ACADEMIC STAFF	
SCHOOL OF DENTAL AND ORAL SURGERY	
COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	297
Emeritus Officers	298
APPENDIX	301
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	
Balance Sheet	302
Statement of Operating Income.....	304
Statement of Investment Income.....	305
Summary of Fund Changes.....	306
Endowment Funds	308
Statement of Significant Accounting Policies..	310
Accountants' Opinion and Report of Auditing Committee.....	311
Group Retirement Plan.....	312
Statistics	313
THE WOMEN'S AUXILIARIES.....	315
THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.	319
THE ALUMNAE ASSOCIATION, SCHOOL OF NURSING.	322
ENDOWED BEDS AND ROOMS.....	323
INDEX TO PROFESSIONAL AND ACADEMIC STAFFS...	332

Origin and Functions of the Columbia-Presbyterian Medical Center

The Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the hospitals and the University the members of the staffs of the hospitals are nominated by Columbia University, and teaching and research are conducted in all the hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institutions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons.

The connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928, the College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. As a part of the Columbia-Presbyterian Medical Center, it is housed in a seventeen story, fire-resisting, steel, brick and concrete building, each floor connecting with the wards and services of Presbyterian Hospital.

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The School of Dental and Oral Surgery

In September, 1916, students in dentistry were admitted to courses in Columbia University at the College of Physicians and Surgeons. On March 15, 1917, the Trustees of Columbia University established a School of Dentistry as of September 27, 1916, so that the conduct of courses from that date, as forming part of the work of the School, might be officially recognized. The School was to be established "upon university lines," meaning "a school the requirements for admission to which shall be the same as those for admission to the Medical School and whose students shall then pursue a four year course, the first two years of which will be almost identical with the first two years of the course of Medicine. The last two years would be given to special preparation for dentistry and dental surgery."

Temporary quarters were utilized on West 39th Street, and in 1920 a small building was erected adjacent to the entrance of the College of Physicians and Surgeons on West 59th Street in which instruction was carried on until the spring of 1923. In the course of that spring and summer, negotiations for the merging of the College of Dental and Oral Surgery with the Dental School of Columbia University were completed and, in September, 1923,

the new institution became the School of Dental and Oral Surgery, established in the buildings of the older private corporation on East 35th Street. On completion of the Medical Center in 1928, the School moved to its present quarters where it is adjacent to the basic science departments of the University, the Medical Library and Vanderbilt Clinic.

The School provides undergraduate instruction in dentistry and dental hygiene. Postgraduate courses in the specialties of dentistry and a master's degree in dental hygiene are offered. Clinics, open to the public, are conducted in all areas of dentistry and the Hospital Dental Service is staffed and maintained by the School.

The School of Nursing

The School of Nursing was founded in 1892 for the training of nurses. Since 1935, its educational program has been under the supervision of the Department of Nursing of the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University. A thirty-two-month course in nursing is conducted, and graduates receive the degree of Bachelor of Science from Columbia University.

William Black Medical Research Building

The newest addition to the Columbia-Presbyterian Medical Center is the 20-story William Black Medical Research Building at 168th Street and Fort Washington Avenue. The building is now used exclusively for research with all departments of P&S expanding their present quarters. The building, dedicated January 3, 1966, was named for William Black, founder and Chairman of the Board of the Chock Full o' Nuts Corp. The financing of the building was made possible in part by a \$5,000,000 gift from Mr. Black to P&S.

Institute of Cancer Research

The Institute of Cancer Research of the Columbia University College of Physicians and Surgeons was established in 1909 with funds bequeathed to the University by George Crocker. It moved from its original quarters on 116th Street to the College of Physicians and Surgeons in 1938. The Francis Delafield Hospital later became the center of clinical and experimental cancer research at P&S. In 1967 a five-story research wing was added to the Delafield Hospital enabling the consolidation of all the laboratories of the Institute in one building. These laboratories now provide the means for extensive investigations of many aspects of cancer and for the postgraduate training of scientists in this field.

The Institute of Human Nutrition

The Institute of Human Nutrition was established in 1958 following the endowment of the R. R. Williams Professorship of Nutrition from the Williams-Waterman Fund. The principal objective of the Institute is to provide the specialized training necessary to combat and prevent the effects of malnutrition. Emphasis is placed on the training of medical students, physicians and biochemists. Degrees offered are the Master of Science in nutrition through the Faculty of Medicine and the Ph.D. in nutrition through the Graduate School of Arts and Sciences. The teaching and research program is organized around three divisions: the Division of Growth and Development, the Division of Nutrition and Metabolism, and the Division of Community Nutrition. Teaching and research facilities are located in the William Black Medical Research Building and at St. Luke's Hospital Center. In addition, the Institute maintains national and international ties with numerous medical schools and research centers.

International Institute for the Study of Human Reproduction

The International Institute for the Study of Human Reproduction was founded in 1965 with a grant from the Ford Foundation, later supplemented by one from the Rockefeller Foundation. Its primary purpose is to do research in the fields of biology, clinical investigation, and the social sciences relevant to the solution of the world population problem. A parallel objective is to study the many complications of the reproductive process affecting human welfare, such as infertility, endocrine disorders, out-of-wedlock pregnancy, marital and other social problems. The Institute is now operating with four divisions: (1) biology and biochemistry, (2) clinical investigation, (3) demography, and (4) development and evaluation of family planning programs throughout the world.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for and includes all of the individual units described below. Mr. Augustus C. Long is Chairman of the Board of Trustees and Mr. A. J. Binkert is President.

The Hospital has an overall capacity of 1,494 beds. Its professional staff consists of 954 attending physicians, 293 residents and interns, and 93 visiting fellows, whose nominations to the staff of the Hospital are made by the College of Physicians and Surgeons of Columbia University.

Students from the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University, residents, interns, fellows, and students at various allied health programs use the Hospital's clinic facilities for their instruction. Some 140,000 patients a year are cared for in the hospitals, clinics and doctors' offices of the Presbyterian Hospital which consists of the following units:

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison Avenue and Park Avenue between 70th and 71st Streets. In 1911 the Presbyterian Hospital and Columbia University's College of Physicians and Surgeons entered into an agreement for coordinating the care of the sick with the education and research programs of the College. This was followed by an alliance agreement in 1922 which led to the Medical Center complex which opened in the fall of 1928 at its present location in Washington Heights. In 1943 Babies Hospital and Neurological Institute were consolidated with Presbyterian Hospital. In 1945 New York Orthopaedic Hospital was consolidated with Presbyterian Hospital. Presbyterian Hospital is the single largest hospital unit, having outpatient facilities for the services of Medicine, Surgery, Obstetrics and Gynecology, Urology, Otolaryngology, Dermatology and Orthopedic Surgery.

Babies Hospital

Babies Hospital was founded in 1887, and located at 657 Lexington Avenue (55th Street), and later moved to two houses at 56th Street and Lexington Avenue. In 1928 Babies Hospital moved to the Medical Center as a separate corporate unit which consolidated with Presbyterian Hospital in 1943. Babies Hospital, the Pediatric Unit, can accommodate 194 patients. A new fourteen story shell addition has been erected, four floors have been completed and the remaining ten floors are being completed in stages by priority of need. When completed the addition will provide modern patient areas, laboratories, classrooms and special care units. Pediatric outpatient clinics are maintained in Vanderbilt Clinic. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

The Dana W. Atchley Pavilion

The Dana W. Atchley Pavilion, located on the corner of Fort Washington Avenue and 165th Street, provides facilities for 175 physicians to see ambulatory patients. The first six floors of this 14-

story building were occupied in December, 1969. The remaining shell floors are for future development.

Harkness Pavilion

Harkness Pavilion, provides in-hospital accommodations for 324 private and semiprivate patients.

The Edward S. Harkness Eye Institute

The Edward S. Harkness Eye Institute, opened in 1933, has a capacity of 100 beds and complete facilities for the medical-surgical treatment of patients with diseases of the eye. In October 1969, a new wing was opened, which provides research facilities and ophthalmologic outpatient facilities.

The Neurological Institute

The Neurological Institute, founded in 1909, was one of the first nongovernmental hospitals in this country for the treatment of diseases of the nervous system. It was originally located on 67th Street and Lexington Avenue, moved to the Medical Center in 1929, and was consolidated with Presbyterian Hospital in 1943, making possible a broad basic program of teaching and research in neurology and the treatment of diseases of the nervous system. The Institute has a capacity of 250 beds, including 15 added in 1960 for psychiatric patients.

The New York Orthopaedic Hospital

The New York Orthopaedic Hospital was originally located at 420 East 59th Street, New York, N. Y. and was opened in 1866 largely because of the interest taken in the care of the crippled by Theodore Roosevelt, father of the President by the same name. In 1911 the first spinal fusion operation for Pott's Disease was performed by Dr. Russell A. Hibbs. Orthopaedic Hospital was consolidated with Presbyterian Hospital in 1945 and moved to the Medical Center in December 1950, where it has accommodations for 93 adults and 29 children. It now occupies the 5th floor of the Presbyterian Hospital building and the 5th floor of Babies Hospital, and additional facilities in Harkness Pavilion.

Radiotherapy Center

The Radiotherapy Center, one of the largest facilities for clinical research and x-ray treatment of cancer, was opened in 1966.

Sloane Hospital for Women

Sloane Hospital for Women was founded in 1886 and was originally located at 59th Street and Amsterdam Avenue. Sloane Hospital moved to the Medical Center in 1928 as a unit of the Presbyterian Hospital. It now occupies three floors of the Pres-

byterian Hospital and one floor of Harkness Pavilion, providing inpatient facilities for 187 patients and 110 bassinets.

The J. Bentley Squier Urological Clinic

Squier Urological Clinic occupies the 10th floor of Presbyterian Hospital, with additional facilities available in Harkness Pavilion. It contains 67 beds for adults and 20 for children.

Vanderbilt Clinic

Vanderbilt Clinic originally presented to Columbia University by the Vanderbilt family in 1888, moved to the Medical Center in 1928 as part of the Presbyterian Hospital. It is now the primary outpatient facility for all units of Presbyterian Hospital averaging about 400,000 clinic visits each year. It is essentially a fully equipped outpatient clinic offering complete medical, surgical and specialty services. At present under construction is an addition to the Clinic, which will provide new and larger quarters for ambulance reception and the treatment of emergencies.

Other Patient Care Institutions Located at the Medical Center

The New York State Psychiatric Institute and Hospital, built and maintained by the State of New

York, is a 174 bed hospital with provisions for the study and treatment of all types of psychiatric disorders.

The Francis Delafield Hospital, built and maintained by the City of New York, is a 261 bed limited general hospital with emphasis on the treatment and study of cancer.

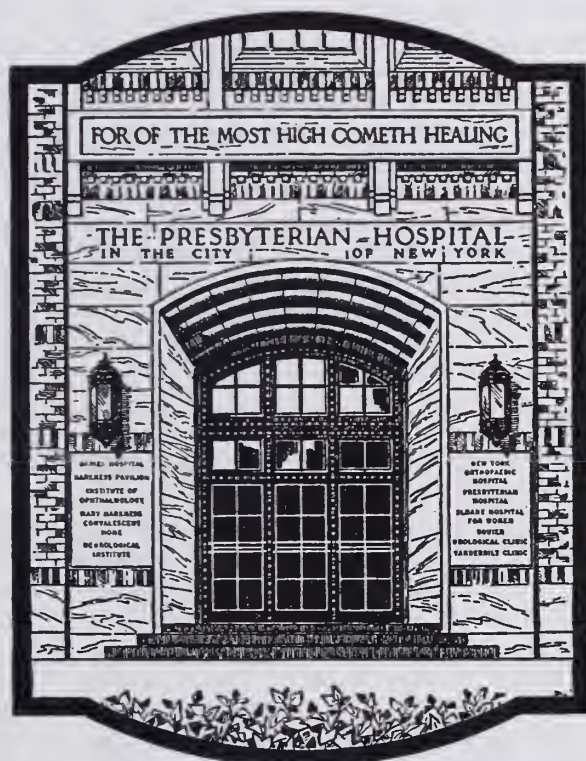
The Washington Heights Health and Teaching Center was built and is maintained by the City of New York.

The Columbia-Presbyterian Medical Center Fund, Inc.

The Columbia-Presbyterian Medical Center Fund, Inc. is a non-profit corporation, formed in 1959, to receive and allocate funds for the Development Program of renewal and expansion of facilities at Columbia University's College of Physicians and Surgeons and The Presbyterian Hospital. Its officers are elected as a Joint Board of Trustees from the Boards of Trustees of the University and Hospital. Gifts and grants to the Fund may be made for specific projects described in the Development Program literature, which is available on request, or they may be unrestricted, to be used by priority of need, as determined by the Joint Board of Trustees.

Report of the Chairman of the Board

The Presbyterian Hospital in the City of New York



Report of the Chairman of the Board of The Presbyterian Hospital for 1972

DURING 1972, The Presbyterian Hospital in the City of New York provided 39,005 patients with 433,561 days of care, and there were 679,571 ambulatory-patient visits to Vanderbilt Clinic and Doctors' Private Offices. The Hospital's operating costs rose by \$6,181,274, compared with 1971, to \$85,429,812, of which \$59,500,400 was for payroll and employee fringe benefits. To meet the needs of new patient-care units, the personnel roster rose by 93, compared to 178 in 1971, to 5,379. A total operating loss of approximately \$10,500,000 was incurred for services provided clinic and ward patients, of which approximately \$6,500,000 was for outpatient services at Vanderbilt Clinic. Such an operating loss, of course, must be offset by allocation of funds from other sources, a large portion of which would normally be used for new services and to maintain and renew the Hospital's physical plant.

During 1972, more than half of the 430,000 visits to Vanderbilt Clinic were charged on the basis of ability of the patient to pay, and this large group paid less than \$6 a visit for services that cost the Hospital — including drugs, x-rays, laboratory tests and other ancillary services — an average of more than \$32 a visit. Clinic revenue, therefore, was less than the cost of providing clinic services by \$6,500,000.

Traditionally, The Presbyterian Hospital has always accepted the responsibility of providing medical care for the indigent within the community it serves, but as costs have continued to spiral, the financial burden of providing services has become prohibitive. We are presently following every possible lead in an effort to find reimbursement funds for at least a portion of losses incurred for providing essential community services.

We are pleased to report that the Hospital's Program of Development and Renewal has continued throughout 1972, although it became necessary to borrow \$6,000,000 in order to carry on work in progress. The following new facilities will have been completed and placed in operation by the time this report is received: the second and final phase of a new Pediatric Radiology Suite on the third floor of Babies Hospital; the new Teaching Amphitheatre on the fourth floor of Babies Hospital; the Reconstructed Facilities for the Ear, Nose and Throat, and Speech and Hearing Clinics on the tenth floor of Vanderbilt Clinic.

Major projects now in progress are: new enlarged modern Emergency Facilities in Vanderbilt Clinic; new facilities to provide Centralized Laboratories, located on the third and fourth floors of the new addition to Babies Hospital and on the fourth floor of the existing building; Neonatal Intensive Care Nursery on the 12th floor of Babies Hospital, are all scheduled for completion late in 1973.

Planning for a new Clinical Research Center, a new Cancer Research Center, and a new Hemodialysis and Renal Unit, to be located on the fourth floor of The Presbyterian Hospital, has been completed and construction is scheduled to start in 1973. Planning for completing the four top floors of the new Babies Hospital Addition as modern pediatric patient-care floors is now being completed and construction is expected to start by summer, 1973.

Funds for the above projects and for the continued development and modernization of the Medical Center's aging facilities are urgently needed. Toward this end, a joint committee, made up of trustees from Presbyterian Hospital and Columbia University, headed by Mr. Harold H. Helm and

Mr. Robert D. Lilley, has reviewed a possible capital campaign to raise needed funds.

We take this opportunity to welcome Dr. Frank E. Stinchfield as the new President of the Presbyterian Hospital Medical Board, and Dr. John H. Laragh as Vice President, each to serve a two-year term. We likewise welcome Dr. Milton R. Porter, a past President of the Medical Board, to the Hospital's administrative staff as Assistant Vice President-Administration. The Board of Trustees also wishes to thank Dr. Hamilton Southworth, whom Dr. Stinchfield succeeded, for his valuable contributions during his two-year term as President.

We are pleased to announce the election of six new trustees during 1972, whose broad experience and deep commitment to community service will strengthen the Board in many areas. They are: Mrs. Carll Tucker, Jr., Mr. Nicholas F. Brady, Dr. Arthur Gerard DeVoe, Mr. Alfred Lee Loomis, Jr., Dr. Paul A. Marks, and Mr. Charles H. Symington, Jr.

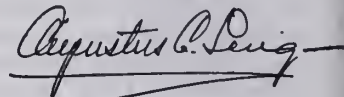
Mr. August Belmont and Mr. Benjamin Strong became honorary trustees in 1972, after rendering valuable services throughout the years; we know that they will continue their deep interest in The Presbyterian Hospital and that we can call on them for help when they are needed.

With sadness and a deep sense of loss, we note the passing of an honorary trustee, Mr. William J. Wardall, and eight physicians who had given much of their lives in the service of humanity at this

Hospital, Drs. Virgil G. Damon, C. Dary Dunham, William B. Parsons, Dickinson W. Richards, David Seegal, Milton Singer, Wilson C. Starr, and Alvin J. B. Tillman.

We take this opportunity to express our admiration and thanks to the professional staff and all personnel for their continued loyalty and dedication to maintaining and enhancing the century-old traditions of service of The Presbyterian Hospital, and our very special thanks and appreciation to our Auxiliaries and Volunteers who serve so faithfully year after year, and without whose help our Hospital could not meet its growing obligations to the thousands who come to it seeking relief from illnesses and pain.

We also wish to thank the many friends and supporters of the Hospital, whose gifts and grants are essential, if the Hospital is to continue its great contributions in patient care, medical education and medical research. A reading of this report will give a better understanding of the extent of the work that is in constant progress at the Medical Center and of why the continued financial support of its friends is needed.



AUGUSTUS C. LONG
Chairman of the Board

April 1, 1973

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

To analyze the current position of the medical profession there are several observations to be made:

First, the specter of increasing costs and decreasing income. The national average cost per-patient-hospital-day is now more than \$100.00 per day. Obviously, there are few who can afford this. Were it not for third party payments, such as Medicare, Medicaid, Blue Cross and other insurance programs the situation would be extremely threatening. The private patient is being taxed almost beyond his capacity to pay hospital expenses.

Finding effective solutions to the many problems in health care in this country cannot be charged to the federal government alone. The medical profession and many of the allied health professions must assume their share of responsibility. At the national level the fragmentation of medicine is so extensive that it seems almost impossible to unify all of its efforts and activities into an entity that would be responsive to the total needs of the country.

As has been said — the hospital is not only an expensive institution but it is also one which a very sick patient and a good doctor cannot do without. This brings us to the question of what constitutes a good hospital? I believe quality medicine is the keyword to the success of any hospital. This must come not only from the professional staff and administration but from all levels. The subject of quality medicine is difficult to define. Ideally, there would be sufficient money and facilities so that quality medicine could be dispensed to everyone. However, it seems to me that the great incentive of the individual physician is the pride and satisfaction he derives from the service he provides. It is the patient's total needs that are important and he must receive the very best care that we, as a unified team,

can give. It is my belief that Presbyterian Hospital comes close to this aim. Every staff appointment must pass a careful review by the College of Physicians and Surgeons as well as by the Chiefs of Service of the Hospital. Other factors contributing to good care are: the large number of attending staff members who have passed their certifying Board examinations; our residency program; the teaching ward rounds; high autopsy percentages and wound infection analysis. These are some of the important practices that can assure a patient that he is receiving "quality medicine". We can and we must do this even better.

We must also face the fact that financing is a necessary — although painful topic. We are embarking on a Medical Center capital drive to expand and renovate Vanderbilt Clinic; up-date and increase the efficiency of the College of Physicians and Surgeons; complete Babies Hospital; reconstitute and up-date portions of Presbyterian Hospital, Neurological Institute and Eye Institute buildings; build The Augustus C. Long Library; Health Sciences Educational Resource Center; and expand and improve laboratory and x-ray facilities. In addition to these, the capital drive hopes to include funds for increased endowment so that the School and the Hospital can make their optimal contribution to the discovery, transmission and application of medical knowledge.

Although I have been in my present position for only the past six months, I have been associated with the Columbia-Presbyterian Medical Center for many years, and I believe that nowhere is there a more dedicated group of hard-working people than here at our great institution. For that reason, I have set aside one afternoon a week to make my-

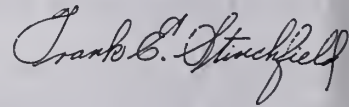
self available to any member of the hospital staff who has a problem, a question, or a suggestion that he or she might like to discuss. In this time of fragmentation of the professional specialties and the pressing commitments which inundate everyone working at the Medical Center, this is an attempt to re-establish a liaison so that there will be some type of common ground on which all can participate. To date, the suggestions and interviews have been most revealing and helpful.

It might be interesting to note one evening a month the President of Columbia University, the Chairman of the Board of Trustees of the Presbyterian Hospital, the President of the Presbyterian Hospital, the Dean of the College of Physicians and Surgeons, and the President of the Medical Board meet to discuss mutual problems and ways to solve them. This group has been concentrating on united effort, efficiency and productivity.

Dr. J. Lawrence Pool, Director of Neurosurgery, Dr. Hamilton Southworth, former President of the Medical Board, and Dr. William A. Langford, at-

tending pediatrician retired this year. Dr. Lester A. Mount was appointed Acting Director of Neurosurgery and Dr. A. Gerard DeVoe was elected to the Board of Trustees. The Hospital is grateful to Dr. Pool, Dr. Southworth, and Dr. Langford for their long years of faithful and dedicated service – and, again, grateful to Dr. Mount and Dr. DeVoe for acceptance of their new responsibilities.

In closing I would like to mention the superb cooperation I have received from the Board of Trustees of Presbyterian Hospital and its Administration, the College of Physicians and Surgeons, the professional staff, and all personnel of the Columbia-Presbyterian Medical Center. It has been an exciting and, hopefully, productive year.

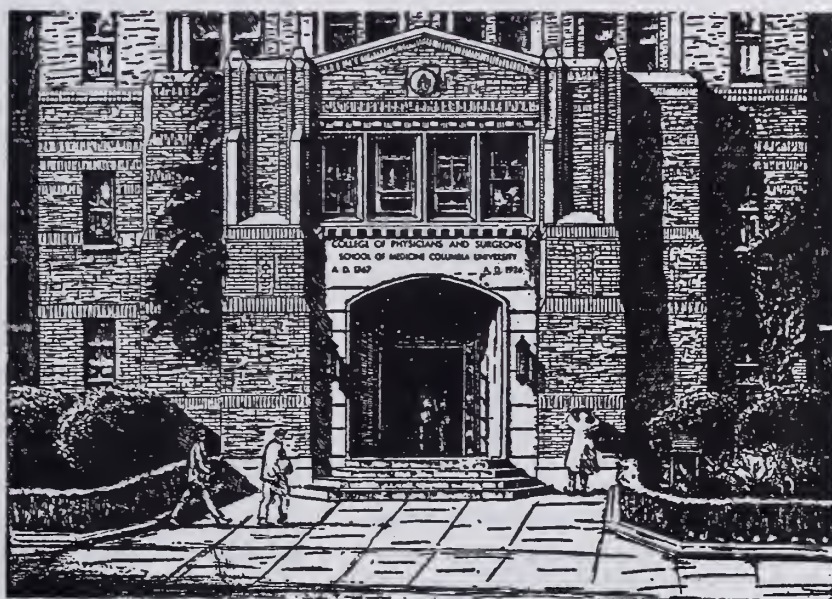


FRANK E. STINCHFIELD, M.D.
President, Medical Board

December 31, 1972

Annual Report of the
Vice President in Charge of Medical Affairs
and the
Dean of the Faculty of Medicine
for 1972

College of Physicians and Surgeons
Columbia University in the City of New York



Report of the Vice President in Charge of Medical Affairs and the Dean of the Faculty of Medicine

I have the honor to submit the annual report of the activities under the Faculty of Medicine for the year ending December 31, 1972. This has been a challenging and eventful year for our Faculty. We have instituted a major examination of our facility requirements to meet the challenges of the next decades in health sciences education, research, and patient care. This long range planning effort is in progress while we work to carefully establish our immediate priorities to cope with the decreases in federal support for health sciences training and the significant changes in patterns of funding for medical research and patient care in the teaching setting.

There are unprecedented pressures for the Faculty of Medicine to scrutinize its objectives. These pressures are directed toward shortening the curriculum, reordering priorities within the curriculum to be more responsive to the needs of health care delivery, increase the production of physicians, dentists, and other health professionals, reorient research programs so that they are more directly related to the care and cure of specific diseases, provide greater access to our facilities for those requiring health care and develop methodology for health care which will increase its efficiency and decrease its cost. These issues have been developed in depth in both recent professional and lay literature and will not be summarized here. It is important to indicate, however, that the School's response to these issues must be in the context of our responsibilities and our resources. Our responsibilities include training of men and women to be physicians, dentists and other health professionals of the highest type and to develop leaders for the American health system, to test and increase our knowledge of both the art and the science of medicine, to foster the highest quality of biomedical research, and to

apply our knowledge to the prevention, cure, and alleviation of human ills. These responsibilities were formulated for this academic health center as early as 1911 by its "founding fathers", in particular Mr. Edward S. Harkness. We must be clear that our continued effort to fulfill these objectives requires that we have the capacity to respond to the changing needs of society. This, in turn, means that we are continually monitoring all aspects of our programs — from admissions policies and curriculum to research programs and patient care services.

In this regard, one may sight some specific important developments within the past year. We can report good progress in the implementation of our Center for Community Health Systems, whose objectives include developing a coherent organizational framework for attacking the problem of improving health care in our immediate community and, hopefully, by implication, other urban communities. Following a year long study of the issue of the four year compared with a three year curriculum, the Faculty and student body recommended no shortening of our present curriculum. Emphasis has been placed on developing new educational opportunities in ambulatory care setting in our affiliated hospitals. An expanded commitment to cancer research has been instituted with the establishment of the Cancer Research Center at the Columbia-Presbyterian Medical Center and its funding by the National Cancer Institute. The Harlem Hospital Center, in a broad interdisciplinary effort involving several departments of our Faculty, has established a major Sickle Cell Center supported by the National Heart Institute.

During the past two years, new chairmen in the Departments of Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, Public Health, Biochemis-

try, Human Genetics and Development and Directors of the Institute of Human Nutrition and the International Institute for the Study of Human Reproduction have assumed their responsibilities and have had an enormous impact on the ability of the College to maintain its leadership and the quality of its educational programs, while reordering its priorities to meet the new opportunities and challenges in biomedical research, health sciences education and health care delivery. The quality of our faculty and student body determines how successful the School will be in this effort. By the end of the 1972-73 academic year, we will, unfortunately, be faced with the retirement of Harry M. Rose, as Chairman of Microbiology, Robert C. Darling, as Chairman of Rehabilitation Medicine, Carl T. Nelson, as Chairman of Dermatology, J. Lawrence Pool, as Chairman of Neurological Surgery (actually, he retired in 1972), all of whom have served the University and Hospital well during their very distinguished careers. In addition, Dr. Shih-Hsun Ngai, Chairman of the Department of Anesthesiology and Dr. Richard L. Masland, Chairman of the Department of Neurology, have indicated their desire to be relieved of their administrative duties, but, fortunately, will remain in their professorial positions. The School is engaged in recruiting to these important posts men of the calibre and quality essential to the success of our programs. At this writing, I am pleased to report excellent progress in these efforts.

Recognizing that no successful organization can rest on past achievements, the College and the Hospital undertook during the past year the most careful examination of its facility requirements to meet the challenges of the coming decade. The Faculty of Medicine is at the present time in an acute phase of physical constraint, while attempting to expand its health sciences educational programs in response to federal and state mandates. During the past year this led to the commissioning of a study by Llewelyn-Davies Associates to develop a pattern for planning for facilities planning management, to review the existing physical facilities and recommend possible forms of reorganization to improve the efficiency of their utilization and to provide a plan consonant with the College's educational and research objectives for the next decade. This study is ongoing but a preliminary report made in the fall of 1972 indicated that there is a serious deficiency of teaching space in total and in size distribution within the College, that the present library is grossly inadequate, as are the audio-visual facilities and that a reorganization of the present pattern of academic teaching and research space utilization was required

to optimize the efficiency of the Faculty and the students. These studies look toward development of priorities for our essential building program.

Student Registration

The registration of the School of Medicine in September, 1972 was as follows:

First Year	149
Second Year	138
Third Year	148
Fourth Year	128
	<hr/> 563

In the School of Public Health the registration in September, 1972 was as follows:

D.P.H.	14
M.P.H.	32
M.S. (Administrative Medicine)	
Regular	29
Community Psychiatry	5
M.S. (Biostatistics)	10
M.S. (Com. and Soc. Psych.)	12
M.S. (Epidemiology)	9
M.S. (Hospital Administration)	13
M.S. (Parasitology)	1
Special Students	18
Residents:	
Administrative Medicine	16
Hospital Administration	15

In the Department of Nursing there have been 267 full-time students working for the baccalaureate degree. Nine registered nurses are working part-time for the baccalaureate degree. There are 16 students working for the master's degree in maternity nursing and nurse-midwifery. Thirteen students are registered for the master's degree in psychiatric community mental health nursing. There are 115 students per year who affiliate with the Department of Nursing for a ten week course in pediatric nursing.

In the Course for Occupational Therapists, fifty-four students were registered in September, 1972. Forty-five students were registered for the Course for Physical Therapists.

The following degrees were awarded:

M.D.	125
Med.Sc.D.	1
M.P.H.	35
D.P.H.	1
M.S. (Nursing, Occupational Therapy and Public Health fields)	84
B.S. (Nursing, Occupational Therapy, Physical Therapy)	132

1971-72
SCHOLARSHIPS

	<i>Amount</i>	<i>Number of Students</i>
P&S Funds	\$293,948	147
Tuition Remission	44,800	16
Health Professions	88,889	49
Other Scholarships (outside agencies, foundations, corporations)	200,412	78
Total	\$628,049	290

LOANS

P&S Funds	8,800	6
AMA-ERF Loans	21,600	16
Health Professions	212,904	104
Guaranteed Bank Loans	108,590	77
Outside agencies	12,600	10
Total	\$364,494	213

Grand total of Scholarships and
Loans Awarded \$992,543

Medical School Admissions

Dr. Frederick G. Hofmann, Associate Dean for Admissions for the Medical School, has been facing the challenges and opportunities of a continuing growth in the number of students seeking admission to P&S. Like most medical schools, P&S received a record number of applications this past year. In 1970-71, 1,962 young people from 336 different colleges applied to P&S; in the application period which ended January 3, 1972, a total of 3,060 applications were received from students representing 471 different colleges and universities. The numbers of applicants in certain categories are recorded in the following table.

<i>The Applicants</i>	<i>1970-71</i>	<i>1971-72</i>
Total number	1,962	3,060
Applications from		
Women	276	557
Black students	224	318
Latin students*	45	78
Applicants interviewed	765	1,265

* Students with Hispanic surnames.

The first and last rows in the table above depict some of the problems which confronted the Committee on Admissions: approximately 1,100 more applications to be evaluated and an additional 500 interviews to be conducted. It is more difficult, if not impossible, to use numbers to describe the Committee's impression of the many truly excellent applicants it had to evaluate last year, for some of the attributes in prospective physicians that the Committee prizes cannot be given numerical values. And ultimately the Committee had to solve the

nearly insoluble problem of selecting just 147 applicants from among the hundreds who had received its highest rankings.

<i>The entering class</i>	<i>1971</i>	<i>1972</i>
Size	137	147
1) Men	109	114
2) Women	28	33
Children of P&S Alumni	5	9
Black students	16	18
Latin students	7	7

The increase in class size to 147 for 1972 was only of slight help to the Committee in the selection of the entering class; with deep regret, it had to deny admission to many very well qualified applicants.

The admission situation at P&S last year makes the reports received by the Office of the Dean from undergraduate campuses across the nation all the more unsettling. For the past several years, the percentage of the entering freshmen who have designated themselves as premedical students has been increasing annually. The prediction that the number of students seeking admission to medical school may double within the next four years cannot be dismissed lightly.

It seems unlikely, at this point in time, that a sufficient number of new medical schools can be established or the sizes of the entering classes in the existing schools be increased significantly to represent together an adequate and timely response to the recent upsurge of interest in medicine. The financial support required for expansion is not now available or even visible on the horizon; the question of whether faculty members in sufficient numbers and of satisfactory quality can be recruited still awaits investigation. Moreover, some people seem to have concluded that the nation's need for physicians is virtually infinite; glib assumptions abound at a time when the need is strong for definitive national plans for the future of medical education. There is a need too for further exploration of career pathways, other than medicine *per se*, in the delivery of health care and in the health sciences that will be both attractive and fulfilling for the disappointed medical school applicant. The numbers of talented young people who will be inevitably frustrated in their medical aspirations within the next few years promise to be appalling. We should know if these individuals could, in paramedical roles, help to remedy some of the current deficiencies in the delivery of health care.

Finances and Administration

The changing pattern of federal and state legislation in support of medical education, research, and

patient care, plus the shifting national priorities with respect to the federal role in training future medical scientists and teachers is placing great stress on the resources of Columbia's Health Sciences units. The demands of these changes are further complicated by increasingly rigorous requirements for program and financial accountability.

The financial pressures on all the schools of the Health Sciences Faculties increased during the calendar year 1972. The pattern and amount of federal program and institutional support are changing rapidly causing severe restraints and mandating the phasing out of a number of programs of great import to the College of Physicians and Surgeons, School of Dental and Oral Surgery, School of Public Health, School of Nursing, and the Allied Health Programs. Although there is a slight increase in outside funds for the year 1972 as compared to 1971, the budgetary cuts by the federal government are having a significant impact in fiscal year 1973

and will produce large reductions in fiscal year 1974. From the tables below it can be seen that we have fewer government grants and contracts at the same time as the overall level of expenditures from government sources have increased. This pattern is the result of successful competition for establishing federally sponsored programs such as the Arteriosclerosis Center, Clinical Research Center, Hypertension Center, Cancer Center, Sickle Cell Center, and others.

At the same time as these new program-oriented research activities are increasing we have seen a moderate decrease in investigator sponsored research. Most significant, however, is the effect of the removal of federal support for the many post-graduate and undergraduate training programs in all the schools of the Health Sciences. Currently the Faculty of Medicine receives \$6,031,000 in annual support from the federal government for its sixty-six funded training programs. According to

TABLE I
GOVERNMENT SPONSORED GRANTS AND CONTRACTS

As of June 30

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Number	430	404	401	386
Amount	39,556,000	42,081,000	46,912,200	48,964,500

TABLE II
ANALYSIS OF FACULTY SALARY SUPPORT AS OF DECEMBER 31,

(000 OMITTED)

Sources of Support	<u>1970</u>		<u>1971</u>		<u>1972</u>	
Outside Sources*	13,860*	65.9%	15,833*	71.5%	18,030*	75.0%
Gifts & Receipts.....	3,483	16.6%	2,601	11.8%	2,465	10.0%
University Endowment Income	2,581	12.3%	1,741	8.1%	1,706	7.1%
University General Income...	1,099	5.2%	1,922	8.6%	1,949	7.9%
	21,023	100.0%	22,097	100.0%	24,150	100.0%

* Government research grants and contracts, Presbyterian Hospital, City Hospital affiliations, Gifts for specific purposes and other Government support.

TABLE III
GENERAL BUDGET SUMMARY

As of December 31, 1972

(000 OMITTED)

	<u>General Income</u>		<u>Endowment Income</u>		<u>Gifts & Receipts</u>		<u>Outside* Sources</u>		<u>Total</u>	
Officers	\$1,949	50.9%	\$1,709	53.6%	\$2,465	46.8%	\$18,030	34.5%	\$24,150	37.4%
Supporting Staff ...	1,403	36.7	975	30.6	1,877	35.6	6,939	13.3	11,194	17.3
Other Expenses	475	12.4	503	15.8	930	17.6	27,299	52.2	29,207	45.3
Total	\$3,827	100.0%	\$3,187	100.0%	\$5,272	100.0%	\$52,268	100.0%	\$64,551	100.0%
% of Total.....	6.9%		4.9%		8.2%		80.0%		100%	

* Estimated expenditures for grants and contracts based on budgets of grants in force as of December 31, 1972.

the announced policies of the federal government all such training support will disappear by fiscal year 1975. Thus the majority of these programs will have to be terminated or severely curtailed unless alternate sources of support develop.

Urban and Community Health Affairs

The Office of Urban and Community Health Affairs under the direction of Dr. George I. Lythcott, Associate Dean, has continued to serve as an interface between the College of Physicians and Surgeons and its immediate and extended communities in a broad spectrum of areas related to health. These communities include those served by our affiliated hospitals — Presbyterian, Harlem, Delafield, St. Luke's and Roosevelt — Washington Heights-Inwood, West and Central Harlem, Morningside Heights and Manhattan Valley. This represents a population of about two million people. The Office is also responsible for the administration of the affiliation programs between Harlem and Delafield Hospitals and the University. By the terms of the affiliation agreements with the New York City Health and Hospital Corporation, the University is responsible for the organization and provision of professional services at Harlem Hospital Center, a 1000 bed municipal hospital, and at Delafield Hospital, a municipal hospital with 350 beds.

The Office has been centrally involved in the recent development of the new Center for Community Health Systems in the Office of the Vice President in Charge of Medical Affairs. The Center has begun to serve as a resource for institutions and groups which provide health care with the major emphasis on improving traditional systems of care and developing new models for health care delivery, in addition to providing a framework for the training of health professionals and allied health professionals.

With financial support from the New York Metropolitan Regional Medical Program, and with the assistance of representatives from the Morningside Renewal Council of Morningside Heights, the Office has conducted and will shortly conclude a feasibility study to explore the development of a prepaid comprehensive health insurance program in the Riverside-Morningside Heights area of Manhattan, to serve a defined segment of the population. This study is with St. Luke's Hospital Center.

With the collaboration of Harlem Hospital Center and Antioch College, the Office has negotiated a contract with the National Institutes of Health for the expansion and further development of a program for the training of Physician Associates at Harlem Hospital Center. The program is one of the

first nationwide to offer a Bachelor of Arts Degree, in conjunction with two years of intensive clinical and academic training, to outstanding former Armed Forces medical corpsmen, nurses aides, medical technicians and other allied health personnel with long standing practical experience in a variety of health fields. Although based at Harlem Hospital, graduates of the program will receive their degrees from Antioch College. The program was previously supported by funds from the Manpower and Career Development Administration of the NYC Human Resources Administration, and the Metropolitan Life Insurance Company.

A Faculty Committee on International Education has continued to provide guidance to students on matters relating to International Education and Health, involving overseas electives for P&S students as well as programs for foreign students, both graduate and undergraduate, at P&S.

The program of the Children's Council for Biomedical Careers (CCBC) is now in its fourth year of operation. The program was initiated by Dr. Doris Mitchell, and administered by the Office of Urban and Community Health Affairs. The program provides an introduction and formal exposure to biomedical careers for elementary, junior and high school students from the Washington Heights and upper Harlem communities. A grant request is currently being negotiated with the Office of Health Manpower Opportunity, National Institutes of Health, for on-going support and further expansion of this program. Funds for this project have previously come from The Urban Center, Mrs. Hope Spencer, the Josiah Macy, Jr. Foundation, the Rockefeller Brothers Fund, New York Community Trust, The Hecksher Foundation for Children, The Lillian Boehm Foundation and the Interreligious Foundation for Community Organization.

Curriculum

Under the direction of Dr. Councilman Morgan Associate Dean, a subcommittee of the Curriculum Committee was formed to determine the advisability of a three year curriculum. The subcommittee agreed with the students, who submitted to the Dean a petition, the summary paragraph of which stated, "We are unconvinced that a three year program will 1) alleviate the doctor shortage 2) be in the medical students' best interest or 3) be in the future patients' interest." The subcommittee voted unanimously that P&S should continue as a four year medical school. This recommendation was unanimously supported by the Faculty Council.

There was extensive discussion in the Faculty

Council concerning the advisability of moving from Pass-Fail to some form of grading. A student poll revealed considerably less opposition on the part of students in the upper classes than by those in the first year. It was the considered judgment of the faculty that while a return to the old grading system was inadvisable there should be recognition of superior achievement and accordingly voted to have Honors, Pass or Fail appear on the official transcript.

The curriculum is under continuous study by the Curriculum Committee. Intensive discussions with the School of Public Health are in progress in order to determine how best to introduce students to the practice and problems of Community Health delivery. The elective program of 14½ months, which is entering its third year, has been very successful. The electives not only provide an opportunity to explore, and thus determine, career choices but substantially enrich and broaden the experience of students before they embark on residency specialization. This is particularly important now that an increasing number of specialty boards no longer require an internship.

Three new courses were made available to students in the first year—legal medicine, statistics and ethics. The latter is an experimental program in a small group discussion format under the direction of Dr. Bernard Schoenberg, dealing with ethical dilemmas and moral conflicts related to decision-making in clinical practice.

A new course offered in the second year, psychosocial aspects of patient care, provides an opportunity for the student to explore his role in the health care team. It enables him to gain greater awareness of the functions of the nurse and other members of the health professions. This course, offered jointly by the Nursing School and Medical School, also focuses on the utilization of Behavioral Science concepts in the approach to patient care.

With the increasing demand for small group teaching not only in the popular elective courses but also in courses of the required curriculum the medical school faces a serious shortage of appropriate facilities. Groups must meet in widely scattered rooms, the majority of which were not designed for seminars and lend themselves poorly to this use. In planning new teaching space particular emphasis is being given to the design of seminar and conference rooms which foster and support teaching in small groups.

Medical Scientist Training Program

The Medical Scientist Training Program (MSTP) was started in 1969-1970 at Columbia to prepare

scientifically talented students for careers in academic medicine and clinical research. The program provides an individualized and flexible curriculum in which each student has the opportunity to become trained in depth in a basic science as well as in clinical medicine. Six outstanding students are selected each year. Preference is given to those who have strong backgrounds in the sciences and have shown interest and ability in research. The MSTP is supported by a training grant from the National Institutes of Health and financial support is provided in the form of a tuition scholarship and stipend for students in the program.

The curriculum includes all the essential courses leading to the M.D. degree, modified to the special needs of each student. Special courses and seminars in basic and clinical medical sciences will also be offered. After the first year and a half (the "basic science core" of the medical curriculum), or after the end of the major clinical year, each student will spend two years in advanced study and research in a chosen field of basic science. The entire facilities of the College of Physicians and Surgeons and other branches of Columbia University will be available, providing a wide range of educational opportunity.

Dr. Brian F. Hoffman serves as Program Director and Drs. John Loeb and Wilbur H. Sawyer are Assistant Program Directors. Responsibility for supervision of the program and for admission of candidates is shared with Deans F. G. Hofmann, Councilman Morgan and Ann S. Peterson and representatives from the Departments of Medicine, Anatomy, Biochemistry, Human Genetics and Development, Microbiology, Pathology and Pharmacology.

The program now is in its fourth year and currently provides support for twenty-two students, two from the class of 1972, four from the class of 1973, six from the class of 1974, four from the class of 1975 and six from the class of 1976. Although the program does not necessarily lead to both the M.D. and Ph.D. degrees, more of the trainees are becoming interested in a combined degree program. During the year two students from the class of 1974 and one from the class of 1975 decided to apply as candidates for the Ph.D. Of the students engaged in full-time research one is working in the Department of Medicine, one in the Department of Biological Sciences, one in the Department of Ophthalmology, and two in the Department of Pharmacology. Students in the class of 1974 are currently selecting the department with which they will conduct research and plan to associate themselves with investigators in the Departments of Pa-

thology, Physiology, Surgery, Pediatrics and Obstetrics and Gynecology. This diversity of research emphasis is in keeping with the primary objectives of the program and the strength in fundamental research provided by all the departments of instruction at the College.

By 1974, when the program will have begun its sixth year, it will provide approximately \$123,400 yearly for the direct support of thirty-six students and \$184,189 in additional support.

Graduate & Postgraduate Programs

The graduate and postgraduate programs of the College of Physicians and Surgeons under the office of Dr. Melvin D. Yahr, Associate Dean for Postgraduate Education, continue to be a major resource for physicians desiring specialized training in various disciplines of medicine as well as for the continuing education of those in general practice. With the many changes in medical school curricula and the elimination of internship requirements in some specialty areas, it is anticipated that this program

will play a more active role in the training of physicians in the years immediately following graduation. During the past year 157 interns and 811 residents received part or all of their training under the direction of faculty members. There were, in addition, 136 fellows and 232 trainees from various parts of the United States and 104 visiting fellows from foreign countries. Many of these physicians participated actively in the clinical activities of the various hospitals affiliated with the medical college, thus contributing to the delivery of medical care to patients within the community.

Special programs in the basic sciences for many of those preparing for specialty practice have been organized to supplement their clinical training. The postgraduate program offered 34 courses in various fields of medicine, of which 4 are new this year. These courses, most of which presented a comprehensive clinical review of the field, attracted 3,000 physicians. Physicians attending these courses were from almost every state in the union, including Alaska and Puerto Rico; Canada, Venezuela, South

	<u>Postgraduate Courses</u>	<u>Number Registered</u>
1968-69	41	1,739
1969-70	58	1,927
1970-71	42	2,948
1971-72	35	2,299
1972-73	34	3,000

DOCTORAL CANDIDATES GRADUATE DEGREE CANDIDATES BASIC SCIENCES

	<u>1972-73</u>	<u>1971-72</u>	<u>1970-71</u>	<u>1969-70</u>	<u>1968-69</u>
Anatomy	8	8	5	6	6
Biochemistry	28	35	45	44	37
Human Genetics & Development *	12	6	5	—	—
Microbiology	17	12	15	9	11
Pathology	8	10	8	7	2
Pharmacology	14	13	14	14	9
Physiology	8	13	14	3	2
	<u>95</u>	<u>97</u>	<u>106</u>	<u>83</u>	<u>67</u>

* Founded 1970-71

TRAINING STATUS 1972-73

	<u>Interns</u>	<u>Residents</u>
Presbyterian Hospital	42	252
Harlem Hospital	57	171
Roosevelt Hospital	37	111
St. Luke's Hospital	29	137
Trainees	232	
Fellows	136	
Visiting Fellows	104	

Africa and the Dominican Republic were also represented. More than 400 students from the various affiliated hospitals — Presbyterian, Roosevelt, St. Luke's and Harlem — audited these courses.

Although the program as presented appears to be serving the needs of a number of physicians, there are still unmet requirements in the continuing education of practicing physicians. It is hoped that some aspects of the program will be reoriented toward community medicine so that it will become a resource which will aid physicians in meeting the health needs of today. To this end, programs devoted to presenting modern health practices in preventive as well as therapeutic medicine will be highlighted. A number of degree programs are offered, including the Doctor of Medical Science degree, Master of Science in Human Nutrition and special certificate programs in Community and Social Psychiatry. During the past year, 3 Master of Science degrees and 1 Ph.D. degree in Human Nutrition were awarded. 17 students are enrolled in the Institute of Human Nutrition. 6 candidates are enrolled in the Doctor of Medical Science degree program and have completed various phases of the requirements. Consideration is being given to the changing patterns in medical education, particularly the new and shortened curricula and the elimination of internship requirements, to proposals for periodic recertification of physicians. Their effects on postgraduate education needs on a national level as well as on those of the immediate community are being assessed. Additional areas being explored include the reorientation of physicians to include the use of allied health personnel, better utilization of centralized services and consultation facilities.

Allied Health Affairs

Following Dr. Robert H. E. Elliott's retirement, Dr. Bernard Schoenberg was appointed as Associate Dean for Allied Health Affairs and Chairman of the Joint Allied Health Council.

In collaboration with the School of General Studies, plans are being considered for the development of new baccalaureate programs in the allied health area with tracks in Health Education, Health Care Administration, Family Life Sciences, Nutrition Sciences, Community Mental Health, and Health Information Systems. During the planning phase of the project, allied health manpower needs and utilization patterns are being studied in order to design a curriculum relevant to present and future health care systems. The academic tracks will include basic liberal arts education, specialized health science courses and clinical experience lead-

ing to direct employment in the health care field or further graduate and professional education.

The Joint Allied Health Council has appointed a committee to review present hospital educational programs with a view toward establishing criteria for granting academic credits to students in hospital training programs and equivalent credits for individuals involved in health care service.

A committee of the Council was appointed to integrate a Health Careers Project program under the chairmanship of Dr. Bernard D. Challenor, Assistant Dean for Urban and Community Health Affairs. The major function of the committee will be to coordinate the efforts of Presbyterian Hospital and the University in providing programs for high school students and other members of the community to become familiar with the multiple opportunities available in the health care occupations and professions. The Council is also exploring the possibility of developing core curricula for the allied health professional and technical programs.

Alumni-Medical School Activities

During the year the P&S Alumni Association, under the leadership of President Edward B. Self and the members of the P&S Alumni Council, continued to work closely with the Dean's Office to promote the interests of the College of Physicians and Surgeons and to organize its graduates towards that end.

The Alumni Association, through its annual Fund Drive and bequests from alumni during this calendar year, contributed \$666,871. Of this, \$355,536 was restricted to scholarship aid for P&S students, \$167,262 was restricted to research, library, endowment and development, and \$144,073 was unrestricted.

The Alumni Association also raised funds to continue the Minority Student Recruitment Program which this year enabled 24 P&S students to visit 70 undergraduate schools, primarily in the south. As a result of these recruiting efforts, there has been a marked increase in the number of applications for admission to P&S and in acceptances of minority students with high academic potential.

Under the Association's expanded Student Alumni Relations Committee, a number of programs have been continued, including a program in which students spend a day with an alumnus in various specialties, receptions for first-year medical students, and sponsorship of the graduating class and their guests at the annual Alumni Dinner Dance, which has become the main school social event of their four years at P&S. On this occasion, the Associa-

tion also honors some of the outstanding graduates and members of its 25th and 50th year reunion classes. The Association has continued the sponsorship and publication of the P&S Quarterly, a highly regarded medical alumni publication, which is sent to all alumni, faculty and students.

In its efforts to involve and organize all of its alumni, the Association has hosted alumni receptions at scientific meetings in various parts of the country, and has assisted the Admissions Committee, through the aid of 75 area representatives of the Association, in interviewing applicants for admission to P&S who were unable to come to New York for personal interviews.

It is with the greatest sorrow that we report the following deaths during the year:

Sam M. Beiser, Professor of Microbiology, on September 7, 1972
J. Douglas Colman, Lecturer in Public Health, on December 8, 1972
Hans T. Clarke, Professor Emeritus of Biochemistry, on October 21, 1972
Virgil G. Damon, Special Lecturer in Obstetrics and Gynecology, on July 9, 1972
Bion R. East, Professor Emeritus of Dental Public Health Practice and Consultant, Presbyterian Hospital, on November 28, 1972
Frank W. Gonzalez, Research Associate in Radiology (Physics), on September 9, 1972
Arthur I. Hutner, Assistant Clinical Professor of Radiology, Roosevelt Hospital, on March 6, 1972
Helen C. Lawler, Research Associate in Psychiatry, on July 3, 1972
Walter S. Root, Professor Emeritus of Physiology, on March 30, 1972
David Seegal, Professor Emeritus of Medicine, on July 24, 1972
John E. Silson, Lecturer in Public Health, on April 10, 1972
Milton Singer, Associate Clinical Professor of Pediatrics, on July 24, 1972
Harry P. Smith, Delafield Professor Emeritus of Pathology, on April 12, 1972
Walter C. Starr, Associate in Ophthalmology, on July 27, 1972
Alvin J. B. Tillman, Associate Professor of Clinical Obstetrics and Gynecology (Retired), on September 17, 1972

The following retirements, as of June 30, 1972 are reported:

Viola W. Bernard, Clinical Professor of Psychiatry
Gregory Brown, Assistant Professor of Pathology
George A. Carden, Clinical Professor of Medicine
Frank D. Carroll, Clinical Professor of Ophthalmology
Stanley M. Dillenberg, Associate in Neurology
Robert H. Elliott, Professor of Clinical Surgery and Associate Dean
Harry Grundfest, Professor of Neurology
William S. Langford, Professor of Psychiatry
J. Lawrence Pool, Professor of Neurological Surgery

Morton D. Schweitzer, Professor of Epidemiology
Hamilton Southworth, Professor of Clinical Medicine
Robert H. Wylie, Professor of Clinical Surgery

The following emeritus designations, effective July 1, 1972, were made by the Trustees:

Harry Grundfest, Professor Emeritus of Neurology
William S. Langford, Professor Emeritus of Psychiatry
J. Lawrence Pool, Professor Emeritus of Neurological Surgery

The following designations were made during the year:

John H. Bryant, DeLamar Professor of Public Health Practice
Harry W. Fritts, Jr., Dickinson W. Richards Professor of Medicine
David V. Habif, Milstein Professor of Surgery
Frederic P. Herter, Auchincloss Professor of Surgery
Robert S. Krooth, Chairman of the Department of Human Genetics and Development
Lester A. Mount, Acting Chairman of the Department of Neurological Surgery
Keith Reemtsma, Valentine Mott Professor of Surgery and Johnson and Johnson Distinguished Professor of Surgery
Bernard Schoenberg, Associate Dean for Allied Health Affairs
Myron Winick, Robert R. Williams Professor of Nutrition

The following promotions were made during the year:

Robert E. Appleby, Assistant Clinical Professor of Pediatrics
William J. Athos, Associate in Medicine, St. Luke's Hospital
Arthur N. Avella, Assistant Clinical Professor of Psychiatry, Roosevelt Hospital
Vernon C. Baker, Instructor in Medicine, Harlem Hospital
Arthur Bank, Associate Professor of Medicine
Herbert Barden, Associate in Neuropathology
Leah Beck, Assistant Clinical Professor of Psychiatry
Albert J. Beckmann, Adjunct Professor of Public Health Practice
Ralph Bell, Associate Professor of Pediatrics
Alexander Beller, Assistant Clinical Professor of Psychiatry
Ruth E. Benesch, Associate Professor of Biochemistry
Soll Berl, Associate Professor of Neurochemistry (in Neurology)
John F. Bertles, Associate Professor of Medicine, St. Luke's Hospital
Charles A. Bertrand, Associate in Medicine, Roosevelt Hospital
J. Thomas Bigger, Associate Professor of Medicine
Louis S. Blancato, Associate Professor of Clinical Anesthesiology, St. Luke's Hospital
Leonard Brand, Professor of Clinical Anesthesiology
Margery M. Braren, Assistant Professor of Sociomedical Sciences
Norma Braun, Instructor in Medicine, Harlem Hospital
Thomas J. Bridges, Assistant Professor of Clinical Neurological Surgery

Anne M. Briscoe, Assistant Professor of Medicine, Harlem Hospital
John S. Britten, Associate Professor of Physiology
Ians R. Brunner, Assistant Professor of Medicine
Ann F. Brunswick, Senior Research Associate in Public Health (Sociomedical Sciences)
John R. Broell, Research Associate in Surgery
Roy H. Brown, Assistant Clinical Professor of Rehabilitation Medicine, Harlem Hospital
William H. Brownlee, Associate in Psychiatry, Roosevelt Hospital
John C. M. Brust, Jr., Assistant Professor of Neurology, Harlem Hospital
Stanley Budner, Associate Professor of Public Health (Sociomedical Sciences)
Marcia B. Bull, Associate in Medicine, Harlem Hospital
John O. Burris, Associate Clinical Professor of Medicine
Vincent P. Butler, Associate Professor of Medicine
Airlie A. C. Cameron, Associate in Medicine, St. Luke's Hospital
William L. Campbell, Assistant Professor of Clinical Radiology
Robert E. Canfield, Professor of Medicine
Paul D. Cannon, Associate Professor of Medicine
George A. Carden, Jr., Clinical Professor of Medicine
Peter W. Carmel, Assistant Professor of Clinical Neurological Surgery
Robert E. Carroll, Professor of Clinical Orthopedic Surgery
Robert B. Case, Associate Professor of Medicine, St. Luke's Hospital
Francesca Castrovo, Associate in Nursing
Bernard D. Challenor, Associate Professor of Epidemiology
Michael H. Cohen, Assistant Professor of Clinical Medicine
D. Jackson Coleman, Associate in Ophthalmology
John T. Connell, Assistant Professor of Medicine, Roosevelt Hospital
Arnold M. Cooper, Clinical Professor of Psychiatry
Richard W. Darrell, Associate in Ophthalmology
David S. David, Assistant Clinical Professor of Medicine, St. Luke's Hospital
John S. Davis, Associate Professor of Clinical Medicine, Mary Imogene Bassett Hospital
Ralph B. Dell, Associate Professor of Pediatrics
Carolyn R. Denning, Associate Professor of Clinical Pediatrics
Karen F. B. Diasio, Assistant Clinical Professor of Rehabilitation Medicine
John C. DiJohn, Associate in Medicine, Harlem Hospital
Thomas F. Dillon, Professor of Clinical Obstetrics and Gynecology
Yvonne T. Driscoll, Assistant Clinical Professor of Pediatrics
Richard G. Druss, Assistant Clinical Professor of Psychiatry
Edward M. Dwyer, Jr., Assistant Professor of Medicine, Roosevelt Hospital
H. Donald Dunton, Professor of Clinical Psychiatry
Roger Duvoisin, Professor of Neurology
John R. Edsall, Associate Clinical Professor of Medicine, Harlem Hospital

Nasseroddin, S. Eftekar, Assistant Professor of Clinical Orthopedic Surgery
Gladys Egri, Associate in Psychiatry, Harlem Hospital
Raimond Emmers, Associate Professor of Physiology
Yale Enson, Associate Professor of Medicine, Harlem Hospital
John W. Espy, Assistant Professor of Clinical Ophthalmology
R. Linsey Farris, Associate in Ophthalmology
Eugene B. Feigelson, Assistant Clinical Professor of Psychiatry, St. Luke's Hospital
M. Irene Ferrer, Professor of Clinical Medicine
Nathaniel Finby, Professor of Clinical Radiology, St. Luke's Hospital
Stanley R. Fine, Assistant Clinical Professor of Medicine, Roosevelt Hospital
Morton A. Fisher, Adjunct Associate Professor of Public Health (Health Administration)
David V. Forrest, Associate in Psychiatry
Joseph L. Fleiss, Adjunct Professor of Biostatistics
David A. Follett, Assistant Professor of Clinical Radiology
Judith E. Frank, Assistant Clinical Professor of Pediatrics, St. Luke's Hospital
Olga Frankel, Assistant Clinical Professor of Psychiatry
Ross M. Grey, Associate Professor of Comparative Pathology
Michael H. Grieco, Associate Clinical Professor of Medicine, St. Luke's Hospital
Albert W. Grokoest, Associate Clinical Professor of Medicine
Dezider Grunberger, Associate Professor of Biochemistry (Institute of Cancer Research)
Paul W. Haberman, Senior Research Associate in Public Health (Sociomedical Sciences)
Ervin E. Hanson, Assistant Clinical Professor of Neurological Surgery, Roosevelt Hospital
Ruth C. Harris, Associate Professor of Clinical Pediatrics
Constance J. Hayes, Assistant Professor of Clinical Pediatrics
Wyllie C. Hembree, Assistant Professor of Medicine and Obstetrics and Gynecology
Jeffrey C. Herman, Assistant Professor of Clinical Medicine, Mary Imogene Bassett Hospital
Marvin Herz, Associate Professor of Clinical Psychiatry
Morton M. Hodas, Associate in Psychiatry
Frank B. Hoeffle, Associate in Ophthalmology
Bentley A. Hollander, Assistant Professor of Clinical Radiology
Peter R. Holt, Associate Professor of Medicine, St. Luke's Hospital
William S. Hopewell, Associate in Medicine, St. Luke's Hospital
George M. Howard, Assistant Professor of Clinical Ophthalmology
James E. O. Hughes, Associate in Neurological Surgery, St. Luke's Hospital
Eugenia T. Gamboa, Research Associate in Microbiology (Neurology)
Alexander Garcia, Professor of Clinical Orthopedic Surgery
Lee R. Gardner, Associate in Psychiatry
Richard A. Gardner, Assistant Clinical Professor of Psychiatry
Willard Gaylin, Clinical Professor of Psychiatry

18 • REPORT OF THE VICE PRESIDENT IN CHARGE OF MEDICAL AFFAIRS
AND THE DEAN OF THE FACULTY OF MEDICINE

Welton M. Gersony, Associate Professor of Pediatrics
Sid Gilman, Professor of Neurology
Allen S. Ginsberg, Assistant Professor of Health Administration
Stephen Glaser, Associate in Pediatrics
Alvin J. Glick, Associate in Psychiatry
Jonas M. Goldstone, Assistant Clinical Professor of Medicine, St. Luke's Hospital
Louise A. Goode, Associate in Microbiology
Maurice F. Goodbody, Associate in Medicine, St. Luke's Hospital
Jerome D. Goodman, Assistant Clinical Professor of Psychiatry
John P. Grant, Assistant Professor of Clinical Urology
Oscar N. Graves, Assistant Clinical Professor of Anesthesiology, Harlem Hospital
Carolyn P. Greenberg, Associate in Anesthesiology
Lynn T. Greene, Associate Professor of Clinical Anesthesiology
George A. Hyman, Associate Clinical Professor of Medicine
Jerry C. Jacobs, Associate Clinical Professor of Pediatrics
A. Gregory Jameson, Associate Professor of Medicine, Roosevelt Hospital
Robert E. Jennings, Assistant Clinical Professor of Pediatrics
Eric Josephson, Associate Professor of Sociomedical Sciences
Paul K. Johnson, Assistant Clinical Professor of Medicine
Daniel L. Kacian, Assistant Professor of Human Genetics and Development
Norman Kahn, Associate Professor of Pharmacology
Joseph E. Kalbacher, Assistant Clinical Professor of Pediatrics
Rosamond Kane, Assistant Clinical Professor of Orthopedic Surgery
John J. Kangos, Assistant Clinical Professor of Pediatrics
Arthur Karanas, Associate in Medicine, Roosevelt Hospital
John D. Karkas, Associate Professor of Biochemistry
Steven E. Katz, Assistant Clinical Professor of Psychiatry, Roosevelt Hospital
John H. Keating, Jr., Assistant Clinical Professor of Medicine, St. Luke's Hospital
William G. Kelly, Assistant Professor of Pharmacology (in Obstetrics and Gynecology)
Clarice J. Kestenbaum, Assistant Clinical Professor of Psychiatry, St. Luke's Hospital
Edward B. Kirsten, Assistant Professor of Pharmacology
Richard D. Kittridge, Associate Professor of Clinical Radiology, St. Luke's Hospital
Abbie I. Knowlton, Associate Clinical Professor of Medicine
Ehud Krongrad, Assistant Professor of Pediatrics
Donald W. Kufc, Instructor in Human Genetics and Development
Arthur E. Laidlaw, Assistant Clinical Professor of Pediatrics, Mary Imogene Bassett Hospital
Naomi Leiter, Associate in Psychiatry
Arthur J. Lennon, Associate in Medicine, St. Luke's Hospital
E. Carwile Leroy, Associate Professor of Medicine

Francis H. L'Esperance, Assistant Professor of Clinical Ophthalmology
John S. Lewis, Associate Clinical Professor of Otolaryngology, Roosevelt Hospital
Stephen J. Levitan, Associate in Psychiatry
John Lindenbaum, Associate Professor of Medicine, Harlem Hospital
Arnold L. Lisio, Associate in Medicine
Letty M. P. Liu, Associate in Anesthesiology
Catherine I. Long, Instructor in Medicine
William P. Lovejoy, Assistant Professor of Clinical Medicine
George I. Lythcott, Professor of Pediatrics
Mary C. MacKay, Assistant Clinical Professor of Psychiatry
Alice Maniatis, Assistant Professor of Clinical Medicine, St. Luke's Hospital
Stephen J. Matseoane, Assistant Clinical Professor of Obstetrics and Gynecology, Harlem Hospital
Shirley A. Mayer, Assistant Clinical Professor of Pediatrics
George H. McCormack, Associate Clinical Professor of Medicine
Rawle M. McIntosh, Associate Professor of Pediatrics
Daniel J. Melia, Assistant Clinical Professor of Pediatrics
Robert B. Mellins, Associate Professor of Pediatrics
Jay I. Meltzer, Associate Clinical Professor of Medicine
Helen C. Meyers, Assistant Clinical Professor of Psychiatry
Frank V. Mignogna, Associate in Otolaryngology
John A. Milici, Assistant Clinical Professor of Psychiatry, St. Luke's Hospital
Jordan Miller, Assistant Professor of Clinical Anesthesiology
Walter L. Mitchell, Assistant Clinical Professor of Pediatrics
William H. Mook, Assistant Professor of Clinical Medicine, Mary Imogene Bassett Hospital
Austin Moore, Assistant Clinical Professor of Psychiatry, Harlem Hospital
Sally Moore, Associate in Ophthalmology
Thomas J. Moore, Associate Professor of Clinical Pediatrics, St. Luke's Hospital
Frank W. Mount, Adjunct Professor of Epidemiology
Moni Nag, Senior Research Associate in Public Health, in International Institute for Study of Human Reproduction
Clayton L. Natta, Associate in Medicine, Harlem Hospital
Harold C. Neu, Associate Professor of Medicine
Robert S. Neuwirth, Professor of Clinical Obstetrics and Gynecology
John F. Nicholson, Associate Professor of Pediatrics
Hymie L. Nossel, Professor of Medicine
Harvey R. Nova, Associate in Neurological Surgery
Winfred Overholser, Jr., Assistant Clinical Professor of Psychiatry
Bernard L. Pacella, Clinical Professor of Psychiatry, Roosevelt Hospital
Robert Pascal, Associate Professor of Pathology, Francis Delafield Hospital
Thomas W. Patrick, Assistant Clinical Professor of Pediatrics

Gerald B. Phillips, Associate Professor of Medicine, Roosevelt Hospital
Bruce Pinkernell, Associate in Medicine, Roosevelt Hospital
Charles E. Pippenger, Research Associate in Neurology
John D. Piro, Associate in Otolaryngology (Prosthetics)
F. Xavier Pi-Sunyer, Assistant Professor of Medicine, St. Luke's Hospital
Herbert E. Poch, Assistant Clinical Professor of Pediatrics
Guy D. Potter, Professor of Clinical Radiology
Harry R. Potter, Assistant Clinical Professor of Psychiatry, Roosevelt Hospital
Richard R. Prouty, Assistant Clinical Professor of Medicine, Harlem Hospital
Morton E. Rachelson, Assistant Clinical Professor of Pediatrics
John D. Rainer, Professor of Clinical Psychiatry
Stephen Reibel, Associate in Psychiatry
Robert M. Reiss, Assistant Clinical Professor of Orthopedic Surgery
John P. Reuben, Associate Professor of Physiology (Neurology)
San C. Rhee, Instructor in Neurology
Richard S. Rivlin, Associate Professor of Medicine, Francis Delafield Hospital
Lloyd Roberts, Assistant Clinical Professor of Pathology, Mary Imogene Bassett Hospital
Dudley F. Rochester, Associate Professor of Medicine, Harlem Hospital
Albert P. Rosen, Assistant Clinical Professor of Pediatrics
Terrone L. Rosenberry, Assistant Professor of Biochemistry (Neurology)
William Rosner, Assistant Professor of Medicine, Roosevelt Hospital
Robert B. Roven, Associate in Medicine, St. Luke's Hospital
Charles T. Ryder, Professor of Clinical Orthopedic Surgery
Ernest Salanitro, Professor of Clinical Anesthesiology
Nicholas Samios, Research Associate in Psychiatry
George Satran, Associate in Psychiatry, Roosevelt Hospital
Bernard Schoenberg, Associate Professor of Clinical Psychiatry
Peter E. Schrag, Assistant Professor of Clinical Medicine
Peter H. G. Schween, Associate in Psychiatry, Harlem Hospital
Herman Schwartz, Professor of Clinical Anesthesiology
Lewis Shapiro, Clinical Professor of Dermatology and Pathology
Lili C. Shalsa, Assistant Clinical Professor of Psychiatry, Roosevelt Hospital
Joyce C. Shaver, Assistant Professor of Clinical Medicine, Roosevelt Hospital
Marvin L. Shelton, Associate Professor of Clinical Orthopedic Surgery
Seiichi Shimomura, Associate in Medicine, St. Luke's Hospital
Gilbert Simon, Associate in Pediatrics

Robert S. Sioussat, Assistant Professor of Clinical Medicine, Mary Imogene Bassett Hospital
William H. Smith, Assistant Clinical Professor of Pediatrics
Harold F. Spalter, Assistant Professor of Clinical Ophthalmology
Leo Srole, Professor of Social Sciences
Walter R. Stankewick, Assistant Clinical Professor of Pediatrics
Jeffrey A. Stein, Assistant Professor of Clinical Medicine
Jerome Stein, Associate in Psychiatry
Alfred Steiner, Clinical Professor of Medicine, Francis Delafield Hospital
Stuart S. Stevenson, Professor of Pediatrics, St. Luke's Hospital
David Stiles, Assistant Clinical Professor of Pediatrics
Samuel Sutton, Professor of Medical Psychology
Bluma Swerdloff, Associate Clinical Professor of Psychiatric Social Work
Lucy H. Swift, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
John A. Talbott, Assistant Clinical Professor of Psychiatry, Manhattan State Hospital
Donald F. Tapley, Professor of Medicine
Reginald Taylor, Assistant Professor of Clinical Psychiatry
Nettie Terestman, Assistant Clinical Professor of Psychiatry
Stephen L. Trokel, Associate in Ophthalmology
Gerald E. Thomson, Professor of Medicine, Harlem Hospital
Gerard M. Turino, Professor of Medicine
Elizabeth Ufford, Assistant Clinical Professor of Pediatrics
Cristobal A. Vicens, Instructor in Medicine
Hsueh-hwa Wang, Associate Professor of Pharmacology
Michelle P. Warren, Assistant Professor of Obstetrics and Gynecology
Elizabeth B. Watkins, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Gerald Weintraub, Associate in Medicine, Roosevelt Hospital
Harvey J. Weiss, Associate Professor of Medicine, Roosevelt Hospital
Robert West, Assistant Clinical Professor of Pediatrics
Doris L. Wethers, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Robert C. Wheeler, Assistant Clinical Professor of Pediatrics
Leo Wilking, Assistant Clinical Professor of Pediatrics
Martin M. Winbury, Adjunct Assistant Professor of Pharmacology
Winifred Winikus, Associate Clinical Professor of Psychiatric Social Work
Emil Wirostko, Associate in Ophthalmology
Paul Witkovsky, Associate Professor of Physiology (Ophthalmology)
Charles E. Wolf, Associate Professor of Clinical Anesthesiology
James A. Wolff, Professor of Pediatrics
Myron Wright, Assistant Clinical Professor of Medicine, St. Luke's Hospital
Earl A. Zimmerman, Assistant Professor of Neurology

The following new appointments were made during the year:

Richard E. Abbott, Research Associate in Physiology
Matteo C. Adinolfi, Research Associate in Institute of Cancer Research
Peggy A. Alsop, Instructor in Neurology, Harlem Hospital
Ina R. Altman, Instructor in Radiology, St. Luke's Hospital
Anastasios Anastasiades, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Anthony Arce, Associate Clinical Professor of Psychiatry
Jeanne Armstrong, Assistant Clinical Professor of Radiology, Harlem Hospital
Patricia A. Beaulieu, Instructor in Nursing
Jeanne W. Baer, Instructor in Radiology, St. Luke's Hospital
Bruce L. Ballard, Associate in Psychiatry, Harlem Hospital
Norman Balinson, Instructor in Psychiatry, Roosevelt Hospital
Alfred C. Bannerman, Instructor in Neurology, Harlem Hospital
Petra E. P. Banogan, Instructor in Pathology, St. Luke's Hospital
William R. Barbee, Assistant in Dermatology
Doris Barker, Instructor in Nursing
Ernst G. Bartsch, Associate in Obstetrics and Gynecology, Roosevelt Hospital
Robert S. Beekman, Assistant Clinical Professor of Medicine, St. Luke's Hospital
Harold Been, Instructor in Psychiatry
Khalid Beg, Research Associate in Medicine
Lowell E. Bellin, Professor of Public Health (Health Administration)
Jules R. Bemporad, Assistant Clinical Professor of Psychiatry
Estelle Bender, Instructor in Psychiatry
Milagros A. Benedicto, Research Associate in International Institute for Study of Human Reproduction
Robert S. Bernstein, Assistant Professor of Medicine, St. Luke's Hospital
Hector R. Bird, Instructor in Psychiatry
Patricia Blagman, Associate in Nursing
Frederick J. Bloomfield, Research Associate in Pathology
Mack Bonner, Instructor in Medicine, Harlem Hospital
Jo Anne Brasel, Associate Professor of Pediatrics
Barbara A. Brennan, Instructor in Nursing
F. James Brennan, Research Associate in Pharmacology
Paula W. Brill, Instructor in Radiology, Harlem Hospital
Levon Z. Boyajian, Assistant Professor of Clinical Psychiatry
Cecil B. Broderick, Instructor in Medicine, St. Luke's Hospital
Nancy C. Brown, Instructor in Nursing
Sherman M. Bull, Instructor in Surgery
Alex Caemmerer, Jr., Associate in Psychiatry, St. Luke's Hospital
Joseph A. Cannaliato, Instructor in Pediatrics, St. Luke's Hospital
Elizabeth W. Carter, Assistant Professor of Nursing
William U. Cavallaro, Instructor in Orthopedic Surgery
Edmund Chaitman, Instructor in Psychiatry, Harlem Hospital

Sonia Charif, Associate in Psychiatry
Marie T. Chiao, Research Associate in Medicine
Ming C. Chiou, Instructor in Anesthesiology, St. Luke's Hospital
Paul J. Chrzanowski, Assistant in Medicine
K. York Chynn, Associate Clinical Professor of Radiology, St. Luke's Hospital
Joseph A. Cimino, Lecturer in Public Health
Noreen M. Clark, Instructor in Public Health (Health Administration)
Herbert I. Cohen, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Paul D. Colman, Research Associate in Biochemistry
Richard C. Conroy, Instructor in Psychiatry
Rene E. Cormier, Instructor in Medicine, Mary Imogene Bassett Hospital
William Cuatico, Research Associate, Institute of Cancer Research
Allan S. Cunningham, Associate in Pediatrics, Mary Imogene Bassett Hospital
Donald P. Dallas, Associate in Medicine, St. Luke's Hospital
Dennis Dalton, Instructor in Psychiatry
Hugh C. Davidson, Instructor in Medicine, St. Luke's Hospital
William J. Davis, Assistant Professor of Pediatrics
Helen A. Derosis, Instructor in Psychiatry, Roosevelt Hospital
Rosina B. Dixon, Instructor in Medicine, Roosevelt Hospital
Iris L. Doerr, Research Associate in Microbiology
Barbara S. Dohrenwend, Lecturer in Public Health
Pamela J. Dudac, Instructor in Nursing
David L. Dunner, Assistant Professor of Clinical Psychiatry
Frances M. Dyro, Assistant in Neurology
Richard N. Edie, Assistant Professor of Surgery
Pauline Edwards, Instructor in Psychiatry, Harlem Hospital
G. Alden Ellison, Instructor in Psychiatry, Roosevelt Hospital
Robert K. Emy, Instructor in Medicine, Roosevelt Hospital
Noble A. Endicott, Assistant Clinical Professor of Psychiatry, Roosevelt Hospital
Aaron H. Esman, Associate in Psychiatry, Roosevelt Hospital
Margaret L. Ewing, Instructor in Pediatrics, Roosevelt Hospital
Beatrice M. Fairchild, Senior Research Associate in Medicine
Elpis Fauntzapoulou, Instructor in Radiology
Alex Ferenczy, Instructor in Pathology
Manuel Fernandes, Assistant Professor of Clinical Urology
Joseph Ferrara, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Paul Filipescu, Instructor in Obstetrics and Gynecology, St. Luke's Hospital
Carol J. Foy, Instructor in Nursing
Karin E. Freas, Instructor in Nursing
John G. Frechofer, Associate in Pediatrics, Mary Imogene Bassett Hospital
Alfred F. Fretz, Instructor in Urology
Shelby Galloway, Instructor in Radiology

Dlga B. Garfein, Instructor in Medicine, Roosevelt Hospital
 Lane H. Gaut, Assistant Clinical Professor of Medicine, St. Luke's Hospital
 Iaralambos P. Gavras, Research Associate in Medicine
 rene Gavras, Research Associate in Medicine
 Francis G. Geer, Associate in Medicine, St. Luke's Hospital
 Visaya M. Ghanta, Research Associate in Pathology
 Elsa-Grace V. Giardina, Instructor in Medicine
 Beth B. Goldsmith, Assistant Professor of Public Health (Health Administration)
 Susan Goodfriend, Instructor in Public Health (Health Administration)
 Carolyn E. Goodstein, Instructor in Medicine, Roosevelt Hospital
 Ajit K. Goswami, Research Associate in Obstetrics and Gynecology
 Belle Granich, Research Associate in International Institute for Study of Human Reproduction
 Henry M. Greenberg, Instructor in Medicine, Roosevelt Hospital
 Justin L. Greene, Associate in Psychiatry, Roosevelt Hospital
 Raphael M. Haller, Assistant Professor of Speech and Hearing
 Gladys C. Halvorsen, Instructor in Psychiatry, Harlem Hospital
 Ronald C. Hamaker, Assistant in Otolaryngology
 Robert H. Hamlin, Adjunct Professor of Health Administration
 Allen Hammerling, Instructor in Health Administration
 Virginia R. Hannon, Lecturer in Public Health
 Ronald L. Hanson, Assistant Professor of Biochemistry
 Marvin L. Hartstein, Instructor in Surgery
 Don R. Heacock, Assistant Clinical Professor of Psychiatry
 Paul Hecht, Assistant Clinical Professor of Psychiatry, Manhattan State Hospital
 Robert D. Henretig, Instructor in Radiology, Mary Imogene Bassett Hospital
 Robert A. Herzlinger, Research Associate in Pediatrics
 Fadel M. Hochroth, Instructor in Pediatrics, St. Luke's Hospital
 John T. Hsu, Assistant Professor of Clinical Radiology, St. Luke's Hospital
 Arthur I. Hutner, Assistant Clinical Professor of Radiology, Roosevelt Hospital
 Sonia W. Hyman, Instructor in Psychiatry, Roosevelt Hospital
 Vivian R. Inglehart, Assistant Professor of Pediatrics, Harlem Hospital
 Bettie S. Jackson, Research Associate in Nursing
 Kenneth Jewel, Instructor in Radiology
 Christopher A. Johnson, Assistant Professor of Clinical Radiology, Harlem Hospital
 Usha M. Joshi, Research Associate in International Institute for the Study of Human Reproduction
 David A. Kahn, Associate in Psychiatry, Roosevelt Hospital
 Patricia S. Kaim, Instructor in Radiology
 William A. Kaloss, Instructor in Pediatrics, St. Luke's Hospital
 Virginia Kanick, Associate Clinical Professor of Radiology, St. Luke's Hospital

Nathan Kaplan, Assistant Clinical Professor of Rehabilitation Medicine
 Vivienne Katz, Assistant in Rehabilitation Medicine
 John D. Kauderer, Assistant in Medicine
 Herman Kaufman, Research Associate in Biochemistry
 Jack Kay, Research Associate in Biochemistry
 Hoshang J. Khambatta, Instructor in Anesthesiology
 Benjamin N. Kightlinger, Instructor in Medicine, St. Luke's Hospital
 Alemka Kisic, Research Associate in Biochemistry to Psychiatric Institute
 Samuel C. Klagsbrun, Associate in Psychiatry, St. Luke's Hospital
 Edward W. Kloth, Instructor in Psychiatry, Roosevelt Hospital
 Richard Kopff, Associate in Psychiatry
 John S. Kovach, Associate Professor of Medicine
 Abraham C. Kowarsky, Instructor in Orthopedic Surgery
 Pauline Krajewski, Instructor in Nursing
 Fred R. Kramer, Instructor in Human Genetics and Development
 Jeffrey Kramer, Associate in Psychiatry, Roosevelt Hospital
 Martin S. Krumerman, Assistant Clinical Professor of Pathology, Roosevelt Hospital
 Donald Kupe, Instructor in Human Genetics and Development
 Joel Kupersmith, Research Associate in Pharmacology (Surgery)
 George F. M. Lam, Research Associate in Human Genetics and Development
 Nomenida A. Lazaro, Instructor in Obstetrics and Gynecology, Harlem Hospital
 Hunter C. Leake, Assistant Clinical Professor of Pediatrics
 Wei-Li S. Lee, Research Associate in Dermatology
 Peter C. Leggiadro, Assistant Clinical Professor of Radiology, Harlem Hospital
 Shirley Lehnert, Assistant Professor of Radiology
 H. Skipton Leonard, Research Associate in Public Health
 Morton Levitt, Research Associate in Psychiatry
 Mary P. Lind, Assistant in Nursing
 Peter Livingston, Instructor in Radiology
 Catherine Lodyjensky, Instructor in Pediatrics, St. Luke's Hospital
 Melvina J. Lohmann, Instructor in Nursing
 Martin I. Lubin, Associate in Psychiatry, Roosevelt Hospital
 David M. MacDonald, Assistant Clinical Professor of Psychiatry, St. Luke's Hospital
 Canagasoorian Mahendran, Assistant in Neurology
 George Mallis, Research Associate in Medicine
 Waleed G. Maloof, Instructor in Urology, St. Luke's Hospital
 Pamela J. Malpoix, Research Associate in Human Genetics and Development
 Sajid Maqbool, Instructor in Pediatrics
 David S. Marsden, Assistant Professor of Radiology, Roosevelt Hospital
 Joseph T. Martorana, Associate in Psychiatry, Roosevelt Hospital
 Herbert J. Marx, Associate Professor of Clinical Medicine, Mary Imogene Bassett Hospital
 Robert S. Mathews, Assistant Professor of Clinical Orthopedic Surgery
 Paul S. May, Lecturer in Public Health

Coronacion Martinez, Research Associate in Ophthalmology
Herbert J. Marx, Associate Professor of Clinical Medicine, Mary Imogene Bassett Hospital
Donald J. Mayerson, Instructor in Psychiatry, Roosevelt Hospital
Haroutune Mekhjian, Instructor in Surgery
Julien Mendelewicz, Research Associate in Psychiatry
Jane I. Mendleson, Instructor in Nursing
Philip Mertz, Associate in Psychiatry
Eunice Messler, Assistant Professor of Nursing
Denis Moran, Research Associate in Orthopedic Surgery
Harry Morgan, Instructor in Radiology
John deL. S. Morris, Assistant Clinical Professor of Radiology, Roosevelt Hospital
Trishit K. Mukherjee, Assistant Professor of Obstetrics and Gynecology
Jeanne B. Murray, Associate in Nursing
V. L. N. Murty, Research Associate in Biochemistry (to Ophthalmology)
Lillian D. Nash, Assistant in Obstetrics and Gynecology
William J. Nelson, Assistant Clinical Professor of Urology, Roosevelt Hospital
Barbara E. Neuhaus, Instructor in Occupational Therapy
James C. Newton, Assistant Professor of Clinical Ophthalmology, St. Luke's Hospital
William M. Nicholas, Assistant in Medicine, Roosevelt Hospital
William D. Niemi, Research Associate in Neurology
Loru Niinaka, Research Associate in Pharmacology
Masumi Nozawa, Research Associate in Surgery
E. Rea Paidousai, Associate in Psychiatry
Peter K. T. Pang, Instructor in Pharmacology
Dhun B. Patel, Assistant Professor of Public Health (Environmental Health Sciences)
Arthur M. Perlman, Instructor in Psychiatry, Roosevelt Hospital
Ann S. Peterson, Associate Professor of Medicine and Associate Dean for Student Affairs
Anne B. Pierson, Assistant Clinical Professor of Obstetrics and Gynecology
Richard N. Pierson, Jr., Assistant Professor of Medicine, St. Luke's Hospital
Jean Pincel, Research Associate in Human Genetics and Development
Conrad L. Pirani, Professor of Pathology
Constantine Photos, Instructor in Urology, St. Luke's Hospital
Marcia L. Pinkett, Instructor in Health Administration
Jacek J. Preibisz, Research Associate in Medicine
Herbert M. Rabin, Assistant Clinical Professor of Medical Psychology
Alan N. Rachleff, Associate in Anesthesiology
Mary A. Radkowski, Instructor in Radiology
Benamanahalli Rejegonda, Assistant in Pediatrics, Harlem Hospital
Francesco Ramirez, Research Associate in Human Genetics and Development
Laurencia B. Regalado, Associate in Radiology, Harlem Hospital
Sandra J. Regenie, Assistant Professor of Nursing
Edward H. Reisner, Assistant Clinical Professor of Medicine, St. Luke's Hospital
Michael J. Reiter, Research Associate in Neurology
William J. Reynolds, Associate in Otolaryngology, Mary Imogene Bassett Hospital

Abraham Risk, Associate Professor of Clinical Obstetrics and Gynecology, Roosevelt Hospital
Dorothy M. Roels, Adjunct Assistant Professor of Health Administration
Constance Rogers, Associate in Health Administration
Stanford A. Roman, Jr., Instructor in Medicine
Michael R. Rosen, Associate in Medicine (Pharmacology), Harlem Hospital
Tove S. Rosen, Research Associate in Pediatrics
Mitchell S. Rosenthal, Associate in Psychiatry, Roosevelt Hospital
Pedro Rosso, Adjunct Assistant Professor of Public Health (in Institute of Human Nutrition)
Arnold M. Rothstein, Instructor in Psychiatry
Richard H. Rowland, Research Associate in International Institute for Study of Human Reproduction
Andrew D. Rucko, Research Associate in Pediatrics
Lucie Rudd, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Rita G. Rudel, Associate Clinical Professor of Medical Psychology (in Neurology)
Theresa E. Russell, Instructor in Health Administration
Gerhart H. Saenger, Senior Research Associate in Epidemiology
Nathan E. Saint-Amand, Instructor in Pediatrics, Roosevelt Hospital
Alan Saroff, Research Associate in Pharmacology (Surgery)
P. G. Satyaswaroop, Research Associate in Surgery
Robert D. Scharf, Associate in Psychiatry, Roosevelt Hospital
Bernardo S. Scheimberg, Instructor in Psychiatry, St. Luke's Hospital
Marianne Schwob, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Bonita P. Schulze, Instructor in Nursing
Headley Scott, Assistant Clinical Professor of Radiology, Harlem Hospital
Balaza Selendy, Instructor in Obstetrics and Gynecology, Mary Imogene Bassett Hospital
Lawrence Shaderowsky, Instructor in Psychiatry
Joseph Shapiro, Assistant in Dermatology
William I. Shaw, Instructor in Radiology
Corazon S. Sian, Instructor in Pathology, St. Luke's Hospital
David Sibulkin, Assistant in Dermatology, Roosevelt Hospital
Barry L. Singer, Instructor in Psychiatry, Roosevelt Hospital
Meredith Sirmans, Assistant Professor of Clinical Obstetrics and Gynecology
Arthur M. Smith, Assistant Professor of Urology
John E. Smith, Research Associate in Medicine
Mary V. Smith, Associate in Nursing
Julio E. Sotelo, Research Associate in Medicine
George Stassa, Assistant Clinical Professor of Radiology, Roosevelt Hospital
Robert D. Stebbins, Research Associate in Pathology
Harold I. Stitt, Assistant Clinical Professor of Radiology, Roosevelt Hospital
Philip C. Su, Instructor in Neurology
Ester S. Suarez, Instructor in Obstetrics and Gynecology, Harlem Hospital
Tomokazu Suzuki, Research Associate in Biochemistry
David S. Svahn, Instructor in Medicine, Mary Imogene Bassett Hospital

Wolf Szmunes, Lecturer in Public Health
Adassah Tamir, Research Associate in Biochemistry
da Truppin, Assistant Clinical Professor of Pediatrics, Roosevelt Hospital
Aiko Uedo, Research Associate in Pathology
Vincent Valensi, Assistant Professor of Clinical Radiology, St. Luke's Hospital
Edwin D. Vaughan, Jr., Research Associate in Medicine
David W. Vaules, Assistant Professor of Clinical Medicine, Mary Imogene Bassett Hospital
James W. Vastola, Instructor in Urology, Roosevelt Hospital
Lurora D. Villafuerte, Associate in Nursing
Thornton S. Walker, Instructor in Medicine, Roosevelt Hospital
Joseph N. Ward, Assistant Clinical Professor of Urology
Lucy D. Warren, Associate in Nursing
Herbert H. Wasserman, Research Associate in Microbiology
Paul T. Westlake, Assistant Clinical Professor of Pathology
William D. Wheat, Associate in Psychiatry, Roosevelt Hospital
Anthony D. Whittemore, Research Associate in Surgery
Robert D. Wickham, Assistant Clinical Professor of Urology, Roosevelt Hospital
Nicholas J. Willson, Associate in Neuropathology
Michael D. Williams, Instructor in Medicine
Lyon Winick, Professor of Pediatrics and Director of the Institute of Human Nutrition
Laine P. Winshell, Research Associate in Medicine
Lyon Wright, Assistant Clinical Professor of Medicine, St. Luke's Hospital
Saburo Yamaguchi, Research Associate in Institute of Cancer Research
Avraham Yaniv, Research Associate in Institute of Cancer Research
Feng-Neng Yeh, Instructor in Obstetrics and Gynecology
Hong C. Yong, Instructor in Anesthesiology
Hong Hai Yum, Instructor in Psychiatry, Harlem Hospital

Prizes

The Janeway Prize, awarded to the graduate who, in the opinion of the Faculty, has ranked highest in efficiency and ability was given to Peter Hasselbacher. Richard A. Stone received the Frederick P. Day Memorial and the Alvin Behrens Memorial Awards. Dr. Louis M. Sherwood, Class of 1961, received the Joseph Mather Smith Prize, which is given to the graduate whose essay or original research in medical subjects is deemed by the Committee on Awards to be the most meritorious.

The William Perry Watson Prize in Pediatrics was awarded to Douglas C. Henry. The Harold Lee Meierhof Memorial Prize in Pathology was given to Michael J. Lotz and Steven S. Searl. The Joseph Garrison Parker Award was given to Charles F. Lovell. The Walter Winchester Prize was given to George F. Davis. Gardner T. Haupt, Jr. was given the Roche Award. The Urology Prize was

given to James S. Bower, William A. Durbin, Jr. and James A. L. Mathers, Jr.

The Bronze Medal, awarded by the Alumni Association to a member of the graduating class in recognition of his interest in and devotion to the College of Physicians and Surgeons was given to Philip J. Huber, Jr. The Margaret Eliot Prize in Nursing was given to Ruthe P. Boyes and Celeste R. Yanni. The Arlene Myers Prize in Nursing was given to Joan C. Stackhouse.

Personnel Health Service

The Personnel Health Service has been under the direction of Dr. Marshall Primack, assisted by Dr. Frank Smith, since July 1, 1972. It had been under the direction of Dr. John Buchanan from January 1, 1972 to June 30, 1972. Dr. J. Kirby Cunningham continues to perform the radiation and pre-employment physical examinations.

In the past year, 2854 patient visits were made compared to 2002 visits the previous year. These included 2579 regular office visits and 275 physical examinations (121 pre-employment, 154 radiation safety).

Services provided were routine physical examinations for employees over 65 years of age, immunizations, Snellen eye tests for driving licenses, annual physical examinations and/or x-rays and laboratory tests for dieticians, animal caretakers and employees exposed to pathogenic substances, pre-marital examinations, allergy injections for medical students and the completion of health reports and insurance forms.

Student Health Service

Beginning September 1971, the office was relocated on the 20th Floor of the Black Building, after having been for one year outside the Medical Center on the ground floor of an apartment house at 170th Street and Fort Washington Avenue.

The Service under the direction of Dr. Albert R. Lamb, Jr. has continued to provide medical care for all Columbia University students, excepting the undergraduate student nurses, studying full-time at the Medical Center. These represent approximately 1000 students — medical, dental, occupational therapy, physical therapy, dental hygiene, public health, graduate dental, graduate nursing and a number of PhD candidates in Biochemistry, Anatomy, Microbiology, Physiology, etc.

Office visits for medical care increased from 2290 to 2835, reflecting the greater convenience of the new location in the Black Building. In addition, physical examinations were performed on all incoming students in Medicine, Dentistry, Dental

Hygiene, Physical Therapy and Occupational Therapy, and chest x-rays were obtained as indicated. A total of 289 physical examinations were done and 365 chest x-rays taken.

There were 1400 visits to various areas in Vanderbilt Clinic. Ten medical students, three dental students, one graduate dental student and one dental hygiene student were hospitalized during the course of the year.

The following table reflects the distribution of office visits to the Health Service:

Medical — 1st year students	354
2nd year students	362
3rd year students	295
4th year students	342
Wives of medical students	170
Wives of Dental students	14
Dental — 1st year students	133
2nd year students	144
3rd year students	135
4th year students	113

Graduate Dental students	72
Dental Hygiene students	136
Occupational Therapy students	126
Physical Therapy students	95
Public Health students	95
Graduate students ..	249
TOTAL	2835

Respectfully submitted,

Paul A. Marks

PAUL A. MARKS, M.D.
Vice President in Charge of
Medical Affairs and
Dean of the Faculty of
Medicine

December 31, 1972

REPORT OF THE VICE PRESIDENT IN CHARGE OF MEDICAL AFFAIRS • 25
AND THE DEAN OF THE FACULTY OF MEDICINE

FACULTY OF MEDICINE

FULL-TIME		1968-69 to 1972-73				
<i>Without Stated Term</i>		<i>1972-73</i>	<i>1971-72</i>	<i>1970-71</i>	<i>1969-70</i>	<i>1968-69</i>
Professor		145	130	128	124	118
Professor of Clinical		6	3	2	2	2
Associate Professor		48	41	56	63	62
Associate Professor of Clinical		5	—	—	—	—
		204	174	186	189	182
<i>Annual</i>						
Professor		7	10	3	3	1
Professor of Clinical		0	2	1	1	1
Clinical Professor		1	1	1	0	0
Associate Professor		45	54	26	10	10
Associate Professor of Clinical		6	3	0	1	1
Associate Clinical Professor		2	4	0	0	1
Senior Reserach Associate		4	—	—	—	—
Assistant Professor		200	202	198	157	198
Assistant Professor of Clinical		19	5	5	6	4
Assistant Clinical Professor		12	8	4	12	2
Associate		61	66	54	49	54
Research Associate		142	131	127	123	127
Instructor		84	76	83	83	71
Assistant		19	34	59	57	48
Special Lecturer		6	7	8	6	4
Lecturer		0	0	0	0	0
Visiting Professor		3	1	3	3	0
Visiting Associate Professor		4	1	0	3	0
Visiting Assistant Professor		1	1	0	1	0
Visiting Instructor		0	0	1	1	0
Visiting Lecturer		1	0	0	0	0
		617	606	573	516	522
TOTAL FULL-TIME		821	780	759	705	704
PART-TIME						
<i>Without Stated Term</i>						
Professor of Clinical		31	30	31	25	24
Associate Professor		7	—	—	—	—
Associate Professor of Clinical		50	45	48	38	36
		88	75	79	63	60
<i>Annual</i>						
Professor		0	0	1	0	0
Professor of Clinical		2	2	0	0	1
Clinical Professor		36	40	42	43	42
Adjunct Professor		16	16	15	11	1
Associate Professor		0	0	1	1	6
Associate Professor of Clinical		8	7	0	1	5
Associate Clinical Professor		102	102	100	89	73
Adjunct Associate Professor		14	12	13	13	13
Senior Research Associate		2	—	—	—	—
Assistant Professor		24	27	18	42	17
Assistant Professor of Clinical		60	46	29	29	31
Assistant Clinical Professor		286	214	180	113	177
Adjunct Assistant Professor		29	30	19	0	1
Associate		199	197	192	228	203
Research Associate		33	40	38	49	42
Instructor		317	289	275	292	274
Assistant		103	93	83	92	81
Research Assistant		0	1	1	1	1
Special Lecturer		25	25	26	33	23
Lecturer		115	123	120	114	120
Visiting Professor		2	1	2	6	1
Visiting Associate Professor		0	0	0	2	0
Visiting Assistant Professor		0	1	0	0	0
Visiting Lecturer		0	0	1	0	0
		1,373	1,266	1,156	1,159	1,112
TOTAL PART-TIME		1,461	1,341	1,235	1,222	1,172
GRAND TOTALS		2,282	2,121	1,994	1,927	1,876

FACULTY OF MEDICINE

1972-73

BASIC SCIENCE DEPARTMENTS	<i>Full-time</i>	<i>Part-time</i>	<i>Total</i>
Anatomy	24	3	27
Biochemistry	53	5	58
Human Genetics	28	3	31
Microbiology	19	7	26
Pathology	52	73	125
Pharmacology	23	11	34
Physiology	19	4	23
	218	106	324
CLINICAL DEPARTMENTS			
Anesthesiology	39	32	71
Dermatology	6	28	34
Medicine	115	262	377
Neurological Surgery	1	14	15
Neurology	45	32	77
Obstetrics and Gynecology	34	52	86
Ophthalmology	21	29	50
Orthopedic Surgery	6	38	44
Otolaryngology	4	27	31
Pediatrics	55	118	173
Psychiatry	64	336	400
Radiology	43	41	84
Rehabilitation Medicine	22	27	49
Surgery	26	105	131
Urology	1	34	35
	482	1,175	1,657
Nursing	55	23	78
Public Health	66	157	223
GRAND TOTAL	821	1,461	2,282

Reports of Departments and Services

Anatomy

EDWARD W. DEMPSEY

Professor and Chairman of the Department

The principal change in our staff during the last year was the resignation on June 30, 1972, of Associate Professor J. Michael Bedford, who left to accept a Professorship in the Department of Obstetrics in Cornell University. Dr. Bedford's work on maturation and capacitation changes in mammalian spermatozoa have been recognized for several years as outstanding, inasmuch as they have provided new leads for studies on the physiology of spermatozoa and these have led to greater understanding of population problems. Dr. Bedford's work has furnished a liaison between this Department and the International Institute for the Study of Human Reproduction. He has also sponsored the work of Dr. James Overstreet who recently obtained his doctor's degree from Cambridge University in a joint enterprise with Columbia. As a trainee under our Medical Scientist Program, Dr. Overstreet is now a candidate for a medical degree in this institution.

Other changes in staff result from increasing reliance upon predoctorate trainees and voluntary personnel in our teaching laboratories. Although by standing policy, our staff strength has long been amplified by such personnel, recent increases in teaching loads coupled with budgetary restrictions have forced greater reliance upon such assistants. Thus, two years ago, enlarged classes exceeded the capacity of our teaching laboratories so that two duplicate sessions had to be arranged. Concomitant budgetary exigencies have led to attrition of our full time staff. We have, therefore, asked our predoctoral and postdoctoral trainees and friends to as-

sume larger roles in our teaching. In microscopic anatomy, Drs. Felix and Shen as Adjunct Assistant Professors, Miss Constance Cardasis and Miss Mary Lee as predoctoral trainees have rendered great service. In gross anatomy, Dr. Richard Hoar of Hoffman-LaRoche, Mrs. Marlene Fukuda and Mr. Robert Cox as predoctoral trainees, and many members of the Department of Surgery have provided greatly valued assistance. In neuroanatomy, Drs. Jon-son Kuo, Dr. Manuel Rivera-Dominguez and Dr. Roberta Pierson have rendered yeoman service. Finally, especial mention is due to Dr. George Smelser who, with a large cadre of assistants from the Eye Institute has provided a remarkable exercise in the anatomy and histology of the eye for our first year class.

The department has been augmented by the addition of Dr. John J. Rasweiler, IV, who recently joined us from Cornell after a two-year sojourn in Cali, Columbia as a postdoctoral Fellow of the Population Council. Dr. Rasweiler's studies on mammalian reproduction are noteworthy and particularly useful at this time as they fill a gap left by Dr. Bedford's departure.

As to curriculum, we have tried hard merely to hold the line during the year. The increased class size, to a total exceeding the number of seats in the lecture auditorium and the number of lockers in our laboratories have forced herculean efforts to meet the demands. Addition of seats in the amphitheatre, improvement of its audiovisual facilities, doubling the number of lockers in the histology laboratory

and increasing the number of students from four to five on each dissecting table are among the many expedients and improvisations adopted to meet this emergency.

The imperatives of a core curriculum adequate for meeting the demands of Board examinations but taught in half the time allowed previously has led us to use an ever-increasing number of audiovisual aids. These were used first in histology, where automatically projected photomicrographs were coupled with a tape-recorded commentary. Ten topics covering most of the subject material of histology can now be presented in this form. We are preparing more as time permits. They have proved such a successful adjunct to our teaching that we are now using similar automatic projection or audio recordings in gross anatomy as well. We are fortunate in having in the department a Medical Illustrator, Mr. Robert Demarest, who prepares many of the visuals which illustrate these topics, and an electronics engineer, Mr. Joseph Reibeisen, who keeps our projectors and recorders in functional condition — no small task in view of their constant night and day use by the students.

Research

The attrition of staff coupled with increased teaching loads mentioned in last year's report, has continued to disarrange and to slow our research activities. Dr. Bedford's leaving will decrease our research activities still further, as he was one of the most energetic of our staff. Nevertheless, we have continued to make progress and to organize our resources and facilities in such a way that we shall be able to continue work at the forefront of our fields despite the increasing austerity of scientific activities.

Research on various aspects of the nervous system has continued actively in the department. New possibilities offered by scanning electron microscopy, phase microscopy and neurohistological techniques have led Drs. Charles Noback, Frederic Agate and Rivera-Dominguez, a trainee, to undertake an extensive study of the spiral Organ of Corti and its central connections. Studies are also being undertaken by Dr. Noback to re-evaluate the relations of olivary-cerebellar connections. Dr. Frederick Mettler has continued his analysis of motor and behavioral changes in monkeys after removing elements of the corpus striatum and has demonstrated various bizarre patterns of activity similar to those observed in patients. Dr. Smelser and his associates have been concerned extensively with the development and cytology of the primate retina.

Dr. Malcolm Carpenter has continued his extensive studies on central nervous system pathways determined by degeneration after discrete lesions in the brains of monkeys. These, undertaken in collaboration with four trainees, have concerned pupillary light reflexes, various pathways between globus pallidus and thalamus and projections from the locus ceruleus. Also, in collaboration with Dr. Ray Henrikson, studies have been initiated involving the appearance of degenerating fibers and pathways as seen by electron microscopy. Dr. Margaret Murray has continued her extended (18 year) investigations of neural tissue cultures, currently emphasizing cells specialized for the production of adrenergic transmitters. Dr. Edward Dempsey is currently finishing a study on the area postrema which indicates that the cytology of this enigmatic structure is similar to that of other circumventricular regions known to have neuroendocrine functions.

Investigations on various aspects of hard tissues have been undertaken energetically by Drs. Melvin Moss and Letty Moss-Salentijn and their collaborators. They have been concerned especially with the dynamics of growth processes in cranio-facial morphology and with developmental processes involving vascularization of epiphyseal plates. Dr. Moss-Salentijn has also collaborated in the publication of an extensive collection of kodachrome transparencies which are designed to assist in the teaching of oral histology and embryology.

Several promising research programs are being developed by the younger staff members of the department. Dr. William Dilley's work on carcinogenic changes in cultures of mammary gland tissues has been recognized by an award of funds from the institutional cancer grant. Dr. Ernest April has recently received a grant from the National Institutes of Health for establishing and operating a laboratory for low-angle x-ray diffraction studies in living muscle. Dr. George Cooper, in collaboration with Drs. Bedford, Lou Miller and Shu Chien, is exploring the relationship of surface charge to physiological activity in several cell systems, notably spermatozoa and erythrocytes. Dr. Robert Hunt's studies on Miocene carnivores has received support from the National Geographic Society and the Geological Society of America, Dr. Patrick Luckett's work on the early development of placentas was assisted by a grant from the Population Council toward his expenses at the Hubrecht Laboratory in the Netherlands. Dr. Rasweiler, who has recently joined the department is presently consolidating the observations carried out on the reproductive systems of South American bats. Dr. Gerard Pereira, in addi-

tion to investigations on the effect of dietary limitations on the formation of secretory materials in the endocrine and exocrine pancreas, has received a grant from the National Institutes of Health to investigate the influence of germ free environments on the development of the lymphatic system.

During the year, the scanning electron microscope which, together with our transmission electron microscopes form the instrumental basis for many of our programs, has been modified by adding to it a multichannel x-ray analyzer coupled with a minicomputer for detecting the presence of various elements in biological structures. This combined instrument permits positive identification of any element, the atomic weight of which is greater than that of fluorine. Its absolute sensitivity approximates 20,000 atoms and its spatial resolution is in the range of 100-500Å. Using this instrument, we have localized and identified silver deposits in the basement membranes of argyric rats, and have shown that silver occurs in the concomitant presence of sulfur and chloride. Administered gold chloride leads to the deposit of gold in kidney tubules. Ischemic calcification has been detected in rat's glomeruli, and both calcium and phosphate have

been demonstrated in the dermal scales of the dogfish. Iron has been identified in the trophoblast of early primate placentas, and the presence of sodium and potassium suggests that this instrument will be useful in studying electrolyte transport.

Acknowledgments

As in past years, our research has been made possible by funds provided by many public and private agencies and individuals. Support has come from the Sinsheimer Fund, the Lillia Babbit Hyde Foundation and the Association for Crippled Children. The National Geographic Society, the Geological Society of America and the Population Council have provided grants-in-aid. The Upjohn Company, The Norwich Pharmacal Company, and Hoffman-LaRoche have made gifts toward the support of various investigations. We have received grants from several of the National Institutes of Health. Support has also come from the International Institute of Human Reproduction, from Drs. Robert Matthews and Austin Johnson toward the costs of collaborative research and from many individuals who have contributed to the Sarah A. Luse Library Fund.

1972 Publications

Anatomy

April, E. W.

The effect of myofilament spacing upon tension. *J. Gen. Physiol.* 57:242, 1971.

April, E. W.; Brandt, P. W.; Elliott, G. F.

The myofilament lattice: Studies on isolated fibers. II. The effects of osmotic strength, ionic concentration, and pH upon the unit-cell volume. *J. Cell Biol.* 53:53-65, 1972.

Baken, R. J.; Noback, C. R.

Neuromuscular spindles in the intrinsic muscles of a human larynx. *J. of Speech and Hearing Res.* 14:513-518, 1971.

Bedford, J. M.

An electron microscopic study of sperm penetration into the rabbit egg after natural mating. *Am. J. Anat.* 133:213-253, 1972.

Bedford, J. M.; Cooper, C. W.; Calvin, H.

Post-meiotic changes in the membranes and nucleus of mammalian spermatozoa. In: *Genetics of the Spermatozoon*. R. A. Beattie and S. Gluecksohn-Waelsch, eds. Forum Printer, Copenhagen, pp. 69-89, 1972.

Bedford, J. M.; Overstreet, J. W.

A method for objective evaluation of the fertilizing ability of spermatozoa irrespective of genetic character. *J. Reprod. Fert.* 31:386-394, 1972.

Benitez, H. H.; Murray, M. R.

Sympathetic interneurons in organotypically cultured ganglia. *Soc. for Neuroscience 2nd Ann. Mtg.*, Houston, Texas, Oct. 1972, p. 76. (Abstract).

Response of sympathetic chain-ganglia isolated in long-term culture, to agents affecting adrenergic neurons. *Soc. for Neuroscience 2nd Ann. Mtg.*, Houston, Texas, Oct. 1972, p. 182. (Abstract.)

Bharati, S.; Dempsey, E. W.; Luse, S. A.

Some ultrastructural observations in the floor of the IV ventricle of the rat and the cat. *Transactions of the Amer. Neuro. Asso.* Vol. 96, 1972.

Brandt, P. W.; Orentlicher, M.

Muscle energetics and the fenn effect. *Biophysical Journal.* 12:515-527, 1972.

Brandt, P. W.; Reuben, J. P.; Grundfest, H.

'Regulation of tension in the skinned crayfish muscle fiber. II. Role of Ca'. *J. Gen. Physiol.* 59:305-317, 1972.

Carpenter, M. B.

Core Text of Neuroanatomy. The Williams and Wilkins Company, Baltimore, 1972.

Carpenter, M. B.; Peter, P.

Accessory oculomotor nuclei in the monkey. *J. f. Hirnforschung*, 12(6):405-417, 1970/71.

Nigrostriatal and nigrothalamic fibers in the rhesus monkey. *J. Comp. Neurol.* 144:93-116, 1972.

- hen, B. L.; Ely, C. A.
Rapid detection of follicle-stimulating hormone by counter-immuno-electrophoresis. *Fed. Proc.* **31**:276, 1972. (Abstract).
- obbs, S. B.; Schwartz, N. B.; Ely, C. A.
The influence of immunologically purified LH and FSH on ovulation. *Soc. for the Study of Reproduction*, Program 5th Meeting. p. 79, 1972. (Abstract).
- Dempsey, Edward W.
The association of endoplasmic reticulum and mitochondria in placental cells. *Proc. Soc. Exp. Biol. and Med.* **139** (3):949-952, 1972.
- The development of capillaries in the villi of early human placentas. *Am. J. Anat.* **134** (2):221-238, 1972.
- erenczy, Alex; Richart, Ralph M.;
Agate, Jr., Frederic J.; Purkerson, Mabel L.;
Dempsey, Edward W.
Scanning electron microscopy of the human fallopian tube. *Science*. **175**:783-784, 1972.
- Scanning electron microscopy of the human endometrial surface epithelium. *Fertility and Sterility*. **23** (8):515-521, 1972.
- Henrikson, R. C.
Mechanism of sodium transport across ruminal epithelium and histochemical localization of ATPase. *Exper. Cell Res.* **68**:456-458, 1971.
- loran, A. H.; Bedford, J. M.
Development of the fertilizing ability of spermatozoa in the epididymis of the Syrian hamster. *J. Reprod. Fert.* **30**:417-423, 1972.
- hant, Robert M.
Miocene amphyconids (Mammalia, Carnivora) from the Agate Spring Quarries, Sioux County, Nebraska. *Amer. Mus. Novitates*. No. **2506**:1-39, 1972.
- nomata, H.; Smelser, G. K.; Polack, Frank M.
Corneal vascularization in experimental uveitis and graft rejection. *Invest. Ophthalmol.* **10**:840-950, 1972.
- nomata, H.; Bill, A.; Smelser, G. K.
Unconventional routes of aqueous humor outflow in cynomolgus monkey (*Macaca irus*). *Amer. J. Ophthalmol.* **73**:893-907, 1972.
- Aqueous humor pathways through the trabecular meshwork and into Schlemm's canal in the cynomolgus monkey (*Macaca irus*): an electron microscopic study. *Amer. J. Ophthalmol.* **73**:760-789, 1972.
- ubowitz, Herbert; Purkerson, Mabel; Luse, Sarah A.;
Dempsey, Edward W.
The effect of transport inhibitors on human red blood cells. *Laboratory Investigation* **27** (2):165-173, 1972.
- Luckett, W. P.
The development of the yolk sac during the first three weeks of gestation in the human and rhesus monkey. *Anat. Rec.* **172**:358, 1972.
- Lyne, A. G.; Henrikson, R. C.; Hollis, D. E.
Development of the epidermis of the marsupial *Trichosurus vulpecula*. *Aust. J. Biol. Sci.* **23**:1067-1076, 1970.
- Masurovsky, E. B.; Benitez, H. H.; Murray, M. R.
Development of interneurons in long-term organotypic cultures of rat superior cervical and stellate ganglia. *Abstracts 12th Ann. Mtg. Am. Soc. Cell Biol.* St. Louis, Mo., p. 166a. Nov., 1972.
- Mettler, Fred A.
Choreoathetosis and striopallidonigral necrosis due to sodium azide. *Exper. Neurol.* **34**:291-308, 1972.
Neuropathological effects of sodium azide administration in primates. *Fed. Proc.* **31**:1504, 1972.
- Mettler, Fred A.; Lieberman, M.
Professional liability — what's to be done. *Bulletin N. Y. Acad. Med.* 2nd Series, **48** (5):779-790, 1972.
- Mettler, Fred A.; Sax, D.
Cerebellar degeneration due to acute azide poisoning. *Brain* **95**(2), 1972.
- Miller, L. H.; Cooper, G. W.; Chien, S.; Fremont, H. N.
Surface charge on *Plasmodium knowlesi* and *P. coatneyi*-infected red cells of *Macaca mulatta*. *Experimental Parasitology* **32**:86-95, 1972.
- Moss, M. L.
Twenty years of functional cranial analysis. *Am. J. Orthod.* **61**:479-485, 1972.
- The vertebrate dermis and the integumental skeleton. *Am. Zool.* **12**:27-34, 1972.
- Bone induction. *Am. Inst. Oral Biol.* pp. 49-58.
- The non-existent hinge axis. *Am. Inst. Oral Biol.* pp. 59-66.
- The role of intrinsic and extrinsic factors in the regulation of skeletal growth. *Am. Inst. Oral Biol.* pp. 67-78.
- Moss, M. L.; Meehan, M. S.; Salentijn, L.
Transformative and translative growth processes in neurocranial development in the rat. *Acta anat.* **81**:161-182, 1972.
- Moss-Salentijn, Letty; Applebaum, Edmund;
Lamme, Alfred
Orofacial histology and embryology—A visual integration (textbook). F. A. Davis Company, Philadelphia, 1972.
- Moss-Salentijn, Letty; Applebaum, Edmund
A minor salivary gland in human gingiva. *Archs. Oral Biol.* **17**:1373-1374, 1972.
- Murray, M. R.
Skeletal muscle in culture. In: *Structure and Function of Muscle*. G. H. Bourne, ed., 2nd edition, Vol. 1, Chapter 6:237-299, Academic Press, New York, 1972.
- Noback, C. R.; Demarest, R. J.
The Nervous System: Introduction and Review. McGraw-Hill, New York. 208 pp., 1972.
- Noback, C. R.; Allison, T.
The brain stem reticular nuclei of the echidna, *Tachyglossus aculeatus*. *Assoc. for Psychophysiol. Study*, **11**:7, 1972.
- Pereira, G. P.
Ultrastructural changes of the mouse pancreas after dietary deficiency. *Anat. Rec.*, **172**:381, 1972.

Pham, Tuan Duc; Luse, Sarah A.; Dempsey, Edward W.
A unique form of endoplasmic reticulum in endocardial endothelia of the desert iguana. *J. Ultrastructure Res.* **39**:149-162, 1972.

Rasweiler, J. J., IV.

The basal or indifferent cell and the ciliary vacuole in the oviducal epithelium of the long-tongued bat. *Glossophaga soricina*. *J. Reprod. Fert.* **30**:191-199, 1972.

Reproduction in the long-tongued bat, *Glossophaga soricina*. I. Preimplantation development and histology of the oviduct. *J. Reprod. Fert.* **31** (2):249, 1972.

Rasweiler, J. J., IV.; de Bonilla, H.

Laboratory maintenance methods for some nectarivorous and frugivorous Phyllostomatid bats. *Lab. Anim. Sci.* **22** (5):658-663, 1972.

Rivera-Dominquez, M.; Agate, F. J., Jr.; Noback, C. R.
Scanning electron microscopic observations of the spiral organ of Corti of the adult rhesus monkey. *Anat. Rec.* **172**:392-393, 1972.

Sax, D. S.; Mettler, Fred A.

Mechanisms of azide ataxia: A result of a chemical cerebellar decortication. *Trans. Amer. Neur. Assoc.* Vol. 96, 1971.

Smelser, G. K.

Modern views of corneal anatomy. *Symposium on the Cornea*, Transactions, New Orleans Academy of Medicine. C. V. Mosby Co., St. Louis, Mo. pp. 1-19, 1972.

Smelser, G. K.; Ozanics, V.

Reaction of the cornea to injury and wound healing. *Symposium on the Cornea*, Transactions, New Orleans Academy of Medicine. C. V. Mosby, Co., St. Louis, Mo. pp. 121-131, 1972.

Development of the cornea. *Symposium on the Cornea*, Transactions, New Orleans Academy of Medicine. C. V. Mosby, Co., St. Louis, Mo. pp. 20-29, 1972.

Tischner, K. H.; Murray, M. R.

The effects of sodium azide on cultures of peripheral nervous system. *J. Neuropath. exper. Neurol.* **31**:393, 1972.

Wulle, K. G.

The development of the productive and drainage system of the aqueous humor in the human eye. *Adv. Ophthalmol.* **26**:269-355, 1972.

Anesthesiology

SHIH-HSUN NGAI

Professor and Chairman of the Department • Director of Service

Staff Changes and Honors

Dr. Leonard Brand was promoted to Professor of Clinical Anesthesiology and Attending Anesthesiologist, and Dr. Charles E. Wolf, to Associate Professor of Clinical Anesthesiology and Associate Attending Anesthesiologist. Dr. Jordan Miller returned from the Public Health Service as Assistant Professor of Clinical Anesthesiology and Assistant Attending Anesthesiologist. Dr. Hoshang J. Khambatta was reassigned to the Presbyterian Hospital as Assistant Attending Anesthesiologist after a year of duty at the Francis Delafield Hospital.

Dr. Robert M. Epstein, Professor and Attending Anesthesiologist, resigned after 17 years of devoted service to become Professor and Chairman, Department of Anesthesiology, University of Virginia. Dr. Letty M. P. Liu left to enter private practice.

Drs. Robert M. Gasway, Peter E. Horowitz and Norman J. Starr completed their research traineeships and entered military service. Dr. Ming-chuan Chiou was appointed Instructor in Anesthesiology and Assistant Attending Anesthesiologist at the St. Luke's Hospital Center. Dr. Richard A. Wiklund joined the faculty of University of Virginia as Assistant Professor of Anesthesiology.

Dr. S. H. Ngai was elected to the Academia Sinica, Republic of China and Chairman, Section on Anesthesiology and Resuscitation, New York Academy of Medicine.

Dr. Lester C. Mark completed his term as Chairman of the Pharmacology-Toxicology Program Committee, the National Institute of General Med-

ical Sciences and continued as its consultant. He was Chairman of the Scientific Program Committee of the Postgraduate Assembly, New York State Society of Anesthesiologists. He also continued to serve on the Executive Committee, Clinical Pharmacology Division of the American Society for Pharmacology and Experimental Therapeutics and as a consultant to the FDA.

Dr. Ronald L. Katz continued as a member of the Anesthesiology Training Committee of the National Institute of General Medical Sciences and consultant to the FDA. He was also appointed to the newly formed Acupuncture Study Committee of the National Institutes of Health.

Dr. L. Stanley James was appointed Chairman of the Committee on Perinatal Biology and Infant Mortality, National Institute of Child Health and Human Development. He was elected Chairman of the American Academy of Pediatrics Committee on Fetus and Newborn and was President of the Perinatal Research Society for the year 1971-72.

Drs. Mieczyslaw Finster and Richard W. Patterson were elected to the Association of University Anesthetists; Drs. Allen I. Hyman and Ralph A. Epstein, to the Society of Critical Care Medicine. Dr. Hyman also served as the Program Chairman, Anesthesia Section, American Academy of Pediatrics.

Dr. Atsuo Fukunaga was awarded first prize and Dr. Horowitz, second prize in the Residents' Research Essay Competition of the American Society of Anesthesiologists.

As in past years, members of the department have given numerous lectures and actively participated in scientific and professional society meetings in the United States and abroad.

Teaching

The introductory course in anesthesiology for medical students continued as in previous years. A new elective course in respiratory and intensive care has been offered. Faculty members assigned to the Inhalation Therapy Service were active in the teaching of respiratory care to residents, nursing staff and paramedical personnel. Dr. Brand contributed to the annual course on emergency care and transportation of the sick and injured, sponsored by the American Academy of Orthopedic Surgeons.

Research

While on leave at the Nuffield Institute for Medical Research, Oxford, Dr. Finster participated in a study of respiratory movements in the fetal lamb, recorded with chronically implanted sensing devices.

In collaboration with Dr. James M. Perel (Psychiatry, Biochemistry), Dr. Finster initiated a study of placental transfer of meperidine and naloxone in pregnant ewes.

Dr. Salha Daniel and co-workers further studied renal function in the fetal lamb. Dr. Hisayo O. Morishima and colleagues observed the effects of maternal hyperthermia (40-42° C) in pregnant baboons.

Dr. James (Pediatrics) and his colleagues continued to study various factors which might contribute to abnormal fetal heart rate in pregnant baboons. Drs. Allen I. Hyman and Ralph A. Epstein began a study of pulmonary gas exchange in neonates requiring long term mechanical ventilation.

Dr. Lubos Triner, in collaboration with Dr. Yvonne Vulliemoz and Miss Mariagnes Verosky, continued to study the role of cyclic AMP in smooth muscle function. The effects of catecholamines, nitroprusside and nitroglycerine on arterial smooth muscle and cyclic AMP system were measured. In spontaneous hypertensive rats the aortic tissue showed significant alterations on the cyclic AMP system associated with a lower sensitivity toward catecholamines.

Drs. Katz, Triner, Vulliemoz and Miss Verosky compared the effects of isoproterenol and a new beta-adrenergic agonist, terbutaline, on smooth muscle function and the cyclic AMP system. In collaboration with Donald Finck, medical student, they showed that aspirin decreased the cyclic AMP levels

in cat jejunum mucosa and prevented cholera-induced diarrhea in animals.

Drs. Jeany Pierre-Louise, David Sprague, Triner and Ngai continued to study effects of anesthetics on arterial smooth muscle as related to adenylyl cyclase activity.

Dr. Gabriel G. Nahas and Mrs. Iris Schwartz observed the effects of delta-9-tetrahydrocannabinol on contractility of rat uterus and aorta in vitro and on blood pressure of spontaneous hypertensive rats.

Drs. Nahas and Henri Boccalon, Visiting Fellow, in collaboration with Dr. James R. Malm (Surgery) and Dr. Gerard M. Turino (Medicine) began to evaluate the applicability and usefulness of the Doll non-invasive electromagnetic flowmeter in man.

Drs. J. Gilbert Stone and Stuart F. Sullivan studied the effect of halothane anesthesia in promoting pulmonary shunting. Drs. Khambatta and Sullivan studied the effect of respiratory alkalosis on carbon dioxide production of the body. The increased CO₂ production seen with alkalosis requires that studies of body CO₂ stores be reevaluated. These studies are in progress. Dr. Sullivan is now using a new on-line computing system in his studies of pulmonary gas exchange.

Drs. Starr and Richard W. Patterson studied the oxygen transfer characteristics of the pump-oxygenator used in open-heart surgery. Dr. Jonathan Benumof developed equations to calculate intra-pulmonary shunting from the washout curve of ¹³³Xe.

Dr. Shirley Markee continued to study the hypotensive action of meperidine in relation to the site of meperidine-induced histamine release in dogs.

Drs. Fukunaga and Robert M. Epstein observed in cats that nitrous oxide acted centrally to increase the blood pressure and heart rate during halothane anesthesia. They also studied the effect of cyclopropane on preganglionic splanchnic nerve discharge. Drs. Robert M. Epstein and Robert Donham initiated a retrospective survey of our experience with induced hypotension during anesthesia since 1960.

Dr. Eugene J. Pantuck, in collaboration with Dr. Ronald Kuntzman and Allan H. Conney of Hoffmann-La Roche, Inc., found in rats and in man that cigarette smoking accelerated the metabolism of phenacetin to N-acetyl-p-aminophenol.

Dr. Paul J. Poppers collaborated with Dr. Conney in a study of enzyme induction and strain differences in metabolism of benzo(a)pyrene in mice.

Drs. Mark, Brand and Perel studied the interactions between thiopental and methylphenidate in dogs and man and between diazepam and diphenhydantoin in dogs. In collaboration with Dr. F. I.

Carroll and associates at the Research Triangle Institute they compared the potency of (R) (+) and (S) (−) isomers of thiopental in man.

Dr. Horowitz, together with Dr. Sidney Spector, developed a highly sensitive immunoassay for tubocurarine, measuring as little as 5ng/ml of biological fluid. Dr. Richard Matteo is using this method to study the pharmacokinetics of d-tubocurarine in man.

Drs. Herbert Rackow and Ernest Salantire completed their study of the pulmonary uptake of nitrous oxide and cyclopropane in neonates and children, including cold stressed infants.

Dr. Joannes H. Karis measured the electrophysiologic action of diazoacetylcholine on single fiber neuromuscular preparations. Drs. Rackow and Salantire initiated a study of the dose-response relationship of d-tubocurarine in infants and children.

Dr. Katz studied the interaction of a new neuromuscular blocking agent, pancuronium, with succinylcholine and halothane. Both of these drugs potentiated the action of pancuronium. He continued his studies of parasympathomimetic and anticholinesterase agents used in anesthesia. Drs. Katz and Poppers completed a study of a new long-acting local anesthetic, W19053, in man. This agent was found to produce analgesia for 10-12 hours.

Dr. Richard A. Wiklund, while at the Clinical Research Center, British Medical Research Council, Harrow, England, studied the effects of general and local anesthetics on mechanisms (microtubules, microfilaments and contractile proteins) related to cellular motility.

Acknowledgment

The department gratefully acknowledges the generous support of its teaching and research program by the National Institute of General Medical Sciences, National Science Foundation, New York City Health Research Council, Astra Pharmaceutical Products, Ayerst Laboratories, Mr. Henri G. Doll, the Bob and Dolores Hope Charitable Foundation, the Morris and Rose Milstein Foundation, Hoffmann-La Roche, Inc. and the Whitehead Foundation.

Patient Care

In 1972, 20,304 patients were attended by the Anesthesiology Service. General anesthesia was administered to 16,145 patients, and regional anesthesia to 3,274. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

The Inhalation Therapy Service treated 12,166 patients in 1972. 737 patients received continuous mechanical ventilation for a total of 3,502 patient days, an increase of 2 percent over the preceding year. In addition, 3,881 patients were treated with intermittent positive pressure breathing devices.

In July, the Surgery-Anesthesiology Intensive Care Unit admitted its first patients. This new unit has eight beds, and is being administered jointly by the Surgery and Anesthesiology Services. Equipped with modern monitoring and treatment facilities, it provides care of critically ill patients, teaching of residents of both services, medical students and nurses, and offers opportunity for clinical investigation leading to improved patient care.

Members of the Inhalation Therapy Service also participated in the reorganization of the Neonatal Intensive Care Unit. A mobile intensive care unit is being staffed and equipped for the transport of sick infants from the community to our facilities.

A new neonatal ventilator has been designed and fabricated by Mr. Arnold St. J. Lee for clinical use in the Neonatal Intensive Care Unit. This device has many features not currently available in commercial models.

Affiliated Hospitals

At the Francis Delafield Hospital, Dr. Veronica Bakamjian returned from a year of sabbatical leave. 938 patients were attended by the Anesthesiology Service; 62 percent of these received regional anesthesia.

At the Harlem Hospital Center, Dr. Herbert G. Cave was elected President-Elect of the Empire State Medical Society of the National Medical Association, and Mrs. Goldie Brangman, President-Elect of the American Association of Nurse Anesthetists. The Inhalation Therapy Service, including the Respiratory Care Unit and Pulmonary Function Laboratory, has been strengthened by assigning additional certified registered nurse anesthetists to its program.

Dr. Louis S. Blancato, Director of Anesthesiology Service, St. Luke's Hospital Center, was elected Vice President, New York State Society of Anesthesiologists. He continued to serve as Assistant Treasurer of the American Society of Anesthesiologists and Advisor to the Section on Anesthesiology and Resuscitation, New York Academy of Medicine. Drs. Joseph Iacovelli and Ennio Gallozzi actively participated in the affairs of the New York State Society of Anesthesiologists as officers and committee members. In 1972, 11,600 surgical

anesthesias were administered at the St. Luke's Hospital Center.

Dr. Richard L. Keenan, Chairman, Department of Anesthesiology, The Roosevelt Hospital, continued as a member of the Committee on Hospital Planning and Construction, The American Society of Anesthesiologists. Dr. Wally Gordon resigned to accept an appointment at the Mount Sinai School of Medicine and the Bronx Veterans Administration Hospital. Dr. Guglielmina Bettini joined the attending staff in October.

Dr. Keenan completed a clinical study of normocapnic nitrous oxide-curare anesthesia without narcotic supplementation. The Department of Anesthesiology at Roosevelt Hospital participated in the development of an on-line computer monitoring system which records and displays cardiovascular functions, including arterial pressure, cardiac output and peripheral resistance, on a minute-to-minute basis. The system has been applied to patients undergoing surgery of the heart and major vessels and patients in intensive care units. 9,588 anesthesias were administered during 1972.

1972 Publications

Anesthesiology

Baer, L.; Kirshman, J. K.; Knowlton, A. I.; Ngai, S. H.; Yang, J. C. and Laragh, J. H.

Suppression of plasma renin (PR) by a monoamine oxidase inhibitor (MAOI). *Clin. Res.* 19:366, 1971. (Abstract)

Baratz, R. A.; Morishima, H. O.; Horiguchi, T.; James, L. S. and Adamsons, K.

Influence of ethanol infusion on the course of spontaneous and induced labor. *Medical Primatology*. S. Karger, Basel, Switzerland, 1971.

Broner, H. J.; Doll, H. G.; Berryer, P. and Nahas, G. G. Non-invasive monitoring of arterial blood flow. *Fed. Proc.* 31:380, 1972. (Abstract)

Dahm, L. Swafford and James, L.

Newborn temperature and calculated heat loss in the delivery room. *Pediatrics* 49:504, 1972.

Daniel, S. S.; Baratz, R. A.; Bowe, E. T.; Hyman, A. I.; Morishima, H. O.; Sarcia, S. R. and James, L. S.

Elimination of hydrogen ion by the fetus and newborn. *Ped. Res.* 6:584, 1972.

Daniel, S. S.; Baratz, R.; Bowe, E. T.; Yeh, M.;

Lallemant, R.; Hyman, A. I. and James, L. S.

Renal response to acid loading in the developing lamb fetus, intact in utero. *Proc. 82nd Ann. Mtg. Am. Ped. Soc.* May 1972. (Abstract)

Finck, A. D. and Katz, R. L.

Prevention of cholera-induced intestinal secretion in the cat by aspirin. *Nature* 238:273, 1972.

Finster, M.

Effects of obstetric anesthesia on the fetus and newborn. In: *Methoden der pharmakologischen Geburtserleichterung und Uterus-Relaxation*. H. Jung, ed., G. Thieme, Stuttgart, 1972.

Placental transfer of anesthetics. *Abstr. Papers Fifth World Cong. Anesth., Kyoto. Excerpta Medica, Int. Cong. Series* 261:20, 1972. (Abstract)

Placental transfer of anesthetics and their distribution in fetal tissues. In: *Proc. Conf. on Toxicology: Implications to Teratology*. R. Newburgh, ed., Washington, D. C., 1971.

Finster, M.; Gibbs, C.; Dawes, G. S.; Heiber, S.; Mark, L. C. and Perel, J. M.

Placental transfer of meperidine (Demerol) and naloxone (Narcan). *Abstr. Sci. Papers, ASA Anesth. Mtg.*, p. 273, 1972. (Abstract)

Finster, M.; Morishima, H. O.; Boyes, R. N. and Covino, B. G.

Placental transfer of lidocaine and its uptake by fetal tissues. *Anesthesiology* 36:159, 1972.

Finster, M.; Morishima, H. O.; Mark, L. C.; Perel, J. M. Dayton, P. G. and James, L. S.

Tissue thiopental concentrations in the fetus and newborn. *Anesthesiology* 36:155, 1972.

Fukunaga, A.

Sympathetic excitation during nitrous oxide-halothane anesthesia in the cat. *Abstr. Sci. Papers, ASA Anesth. Mtg.*, p. 61, 1972. (Abstract)

Garfield, J. M. and Stone, J. G.

A comparison of psychological responses to ketamine and thiopental-N₂O halothane anesthesia. *Anesthesiology* 36:329, 1972.

Geddes, I. C.; Brand, L.; Finster, M. and Mark, L. C.

Distribution of halothane-⁸²Br in maternal and fetal guinea pig tissue. *Brit. J. Anaesth.* 44:542, 1972.

Gersony, W. N.; Morishima, H. O.; Kohl, S.; Daniel, S. S. and James, L. S.

The hemodynamic assessment of experimental respiratory distress syndrome. *Proc. 82nd Ann. Mtg. A Ped. Soc.*, 1972. (Abstract)

Ginsburg, S.; Kitz, R. J. and Savarese, J.

Neuromuscular blocking activity of a new series quaternary N-substituted choline esters. *Brit. J. Pharmacol.* 43:107, 1971.

Horowitz, P. and Spector S.

Development of a radioimmunoassay for d-tubocurarine. *Fed. Proc.* 31:533, 1972. (Abstract)

James, L. S. and Morishima, H. O.

Mechanism of late deceleration of the fetal heart rate. *Int. J. Obstet. Gynec.* 10:182, 1972. (Abstract)

- James, L. S.; Morishima, H. O.; Daniel, S. S.; Lowe, E. T.; Cohen, H. and Niemann, W. H. Mechanism of late deceleration of the fetal heart rate. *Am. J. Obstet. Gynec.* **113**:578, 1972.
- Jewelewicz, R.; James, L. S.; Finster, M.; Dyrenfurth, I.; Warren, M. and Vande Wiele, R. L. Quintuplet gestation after ovulation induction with menopausal gonadotropins and pituitary luteinizing hormone. *Obstet. Gynec.* **40**:1, 1972.
- Jonsson, I.; Barton, M. D.; Daniel, S. S.; James, L. S. and Adamsons, K. The response of the unanesthetized sheep fetus to sympathomimetic amines and adrenergic blocking agents. *Am. J. Obstet. Gynec.* **114**:43, 1972.
- Katz, R. L. Drug therapy. Sedatives and tranquilizers. *New Engl. J. Med.* **286**:757, 1972.
- Katz, R. L. and Katz, G. J. Clinical experience with parasympathomimetics and anticholinesterases in anesthesia. In: *Le Systeme Cholinergique*. G. G. Nahas, J. Salamagne, P. Viars and G. Vourc'h, eds. Librairie Arnette, Paris, 1972.
- Kumbatta, H. J. and Baratz, R. A. IPPB, plasma ADH, and urine flow in conscious man. *J. Appl. Physiol.* **33**:362, 1972.
- Kumbatta, H. J. and Sullivan, S. F. Effect of alkalosis on tissue respiratory gas exchange. *Abstr. Papers Fifth World Cong. Anesth., Kyoto. Excerpta Medica, Int. Cong. Series* **261**:20, 1972. (Abstract)
- Effect of passive hyperventilation alkalosis on carbon dioxide production of the body. *Fed. Proc.* **31**:347, 1972.
- Keenan, R. L. Nitrous oxide-curare anesthesia: Reappraisal. *Med. Coll. Va. Quarterly* **8**:142, 1972.
- Postoperative intensive respiratory care. *N. Y. State J. Med.* **72**:1955, 1972.
- Lee, A. S. J. Impact of electronics instrumentation in hospitals. *Digest of Proceedings of Third National Conference on Electronics in Medicine*. McGraw-Hill Publications, 1971.
- Mandel, I. and Katz, R. L. Effect of pilocarpine and a beta adrenergic blocking agent on human saliva. *Pharmacol. Therap. Dentistry* **1**:71, 1971.
- Mark, L. C. Barbiturates and the parasympathetic nervous system. In: *Le Systeme Cholinergique*. G. G. Nahas, J. C. Salamagne, P. Viars and G. Vourc'h, eds. Librairie Arnette, Paris, 1972.
- Nomenclature morass. *JAMA* **219**:1069, 1972. (Letter to Editor)
- Mark, L. C.; Perel, J. M. and Brand, L. Early thiopental recovery: Redistribution, not metabolism. *Anesthesiology* **36**:412, 1972. (Letter to Editor)
- Monkcom, W. and Patterson, R. W. Ventilation-perfusion inequalities resulting from hypocapnic changes in lung mechanics. *J. Thor. Cardiovasc. Surg.* **63**:577, 1972.
- Morishima, H. O.; Heymann, M. A.; Rudolph, A. M. and Barrett, C. T. Toxicity of lidocaine in the fetal and newborn lamb and its relationship to asphyxia. *Am. J. Obstet. Gynec.* **112**:72, 1972.
- Morishima, H. O. and Hyman, A. I. Anesthesia for hysterotomy in the subhuman primate. *Medical Primatology*, S. Karger, Basel, Switzerland, 1971.
- Morishima, H. O.; Mueller-Heubach, E. and Shnider, S. Body temperature and disappearance of lidocaine in newborn puppies. *Anesth. Analg.* **50**:938, 1971.
- Nahas, G. G. Cannabis sativa. *N. Y. St. J. Med.* **72**:856, 1972.
- Marihuana — Deceptive Weed. Raven Press, N. Y., 1972.
- Systeme parasympathique et milieu interieur. In: *Le Systeme Cholinergique*. G. G. Nahas, J. C. Salamagne, P. Viars and G. Vourc'h, eds. Librairie Arnette, Paris, 1972.
- Toxicology and pharmacology of cannabis sativa with special reference to Δ^9 -THC. *Bull. Narcotics* **24**:11, 1972.
- Nahas, G. G.; Broner, J. J.; Doll, H. G. and Berryer, P. Non-invasive monitoring of arterial blood flow in man. *Circulation* **45-56** (Suppl. II):196, 1972.
- Nahas, G. G.; Poyart, C. F.; Kleisbauer, J. P.; Verosky, M. and Vulliemoz, Y. Activated lipolysis and pH changes. *Ann. N. Y. Acad. Sci.* **185**:137, 1971.
- Nahas, G. G.; Salamagne, J. C.; Viars, P. and Vourc'h, G. Editors, *Le Systeme Cholinergique en Anesthesiologie et en Reanimation*. Librairie Arnette, Paris, 1972.
- Nahas, G. G.; Tannieres, M. L.; Gombaud-Saintonge, G. and Lennon, J. F. Systeme pour l'etude du sang sous microscope. *C. R. Soc. Biol.* **165**:544, 1971.
- Ngai, S. H. Parkinsonism, levodopa and anesthesia. *Anesthesiology* **37**:344, 1972.
- Pharmacology of parasympatholytics agents (Peripheral action). In: *Le Systeme Cholinergique*. G. G. Nahas, J. C. Salamagne, P. Viars and G. Vourc'h, eds. Librairie Arnette, Paris, 1972.
- Ngai, S. H. and Wiklund, R. A. Levodopa and surgical anesthesia. *Neurology* **22**:38, 1972.
- Noel, G. L.; Suh, H. K.; Stone, J. G. and Frantz, A. G. Prolactin response to surgery and other forms of stress in men and women. *Clin. Res.* **20**:435, 1972. (Abstract)
- Pantuck, E. J.; Kuntzman, R. and Conney, A. H. Decreased concentration of phenacetin in plasma of cigarette smokers. *Science* **175**:1248, 1972.

- Pantuck, E. J.; Nakamura, K.; Maggio, A. and Conney, A. H.
Effect of cigarette smoking on plasma levels of phenacetin in man. *Fed. Proc.* 31:538, 1972. (Abstract)
- Patterson, R. W.
Role of carbon dioxide in changes in lung mechanics after protamine administration. *Anesth. Analg.* 51:733, 1972.
- Perel, J. M.; Brand, L.; Heiber, S. and Mark, L. C.
Effect of methylphenidate on rate of disappearance of thiopental from plasma. *Clin. Res.* 20:411, 1972.
- Philbin, D. M.; Patterson, R. W. and Baratz, R. W.
Continuous pressure ventilation and oxygen delivery. *Brit. J. Anaesth.* 44:667, 1972.
- Poppers, P. J.
Anesthetic management for cesarean section. *Rev. Mex. Anest.* 21:123, 1972.
Obstetric anesthesia and analgesia. In: *Current Therapy*. H. F. Conn, ed. W. B. Saunders, Phila., 1972.
Ultrasonic techniques in anesthetic management. *Rev. Mex. Anest.* 21:149, 1972.
- Poppers, P. J.; Hochberg, H. M. and Schmalzbach, E. L.
Popliteal artery blood pressure measurement by ultrasound technique. *Excerpta Medica, Int. Cong. Series* 261:104, 1972.
- Poppers, P. J.; Katz, R. L.; Meyer, M. and Covino, B. G.
Ulner nerve block with W-19053. A new long acting local anesthetic agent. *Abstr. Sci. Papers, ASA Ann. Mtg.*, p. 109, 1972. (Abstract)
- Prys-Roberts, C.; Foex, P.; Greene, L. T. and Waterhouse, T. D.
Studies of anaesthesia in relation to hypertension: IV: The effects of artificial ventilation on the circulation and pulmonary gas exchanges. *Brit. J. Anaesth.* 44:335, 1972.
- Rackow, H.
The parasympathetic nervous system in the anesthetized infant and child. In: *Le Systeme Cholinergique*. G. G. Nahas, J. C. Salamagne, P. Viars and G. Vourc'h, eds. Librairie Arnette, Paris, 1972.
- Robison, G. A.; Nahas, G. G. and Triner, L.
Editors, *Cyclic AMP and Cell Function*. Ann. N. Y. Acad. Sci. 185, 1971.
- Stanley, T. H.; Zikria, B. A. and Sullivan, S. F.
The surface tension of tracheal-bronchial secretions during general anesthesia. *Anesthesiology* 37:445, 1972.
- Starr, N. J. and Patterson, R. W.
Prediction of oxygen tensions during cardiopulmonary bypass. *Bull. N. Y. Acad. Med.* 48:990, 1972.
- Sullivan, S. F.
Oxygen transport. *Anesthesiology* 37:140, 1972.
- Suzuki, K.; Horiguchi, T.; Comas-Urrutia, A. C.; Mueller-Heubach, E.; Morishima, H. O. and Adamsons, K.
Pharmacology effects of nicotine upon the fetus and mother in the rhesus monkey. *Am. J. Obstet. Gynec.* 111:1092, 1971.
- Tannieres, M. L.; Gombaudo-Saintonge, G.; Lennon, J. F. and Nahas, G. G.
Effets de deux anesthésiques halogénés sur la vitesse de reptation leucocytaire. *J. Physiol. (Paris)* 63:292A, 1971.
- Triner, L.; Nahas, G. G.; Vulliemoz, Y.; Overweg, N. I. A.; Verosky, M.; Habif, D. V. and Ngai, S. H.
Cyclic AMP and smooth muscle function. *Ann. N. Y. Acad. Sci.* 185:458, 1971.
- Triner, L.; Verosky, M.; Overweg, N. I. A.; Vulliemoz, Y. and Nahas, G. G.
Acetylcholine and the cyclic AMP system in smooth muscle. In: *Physiology and Pharmacology of Cyclic AMP*. Satellite Symp. XXV Int. Cong. Physiol. Milan, 1971. (Abstract)
Cyclic 3',5'-AMP and the regulation of uterine tone and contractility. *Proc. XXV Int. Cong. Physiol. Sci.*, Munich, 1971. (Abstract)
- Triner, L.; Vulliemoz, Y.; Verosky, M.; Habif, D. V. and Nahas, G. G.
Adenyl cyclase phosphodiesterase system in arterial smooth muscle. *Life Sci.* 11:817, 1972.
Cyclic AMP and vascular smooth muscle function. In: *Vascular Smooth Muscle*. E. Betz, ed., Springer-Verlag, N. Y., 1972.
Cyclic AMP in vascular smooth muscle. *Fifth Int. Cong. Pharmacol.*, San Francisco, p. 236, 1972. (Abstract)
- Triner, L.; Vulliemoz, Y.; Verosky, M.; Manger, W. M. and Nahas, G. G.
Cyclic AMP and vascular reactivity in spontaneous hypertensive rats. *Fed. Proc.* 31:556, 1972. (Abstract)
- Triner, L.; Vulliemoz, Y.; Verosky, M. and Nahas, G. G.
Acetylcholine and cyclic AMP. In: *Le Systeme Cholinergique*. G. G. Nahas, J. C. Salamagne, P. Viars and G. Vourc'h, eds. Librairie Arnette, Paris, 1972.
Acetylcholine and the cyclic AMP system in smooth muscle. *Biochem. Biophys. Res. Comm.* 46:1866, 1972.
- Villanueva, R.; Hinds, L.; Katz, R. L. and Eakins, K. E.
The effect of polyphloretin phosphate on some smooth muscle actions of prostaglandins in the cat. *J. Pharmacol. Exp. Ther.* 180:78, 1972.
- Wiklund, R. A. and Allison, A. C.
Anaesthetics — Effect on motility of *Dictyostelium discoideum*. *Nature* 239:221, 1972.

Biochemistry

ERWIN CHARGAFF

Professor and Chairman of the Department

Drs. Ruth E. Benesch, John Karkas and Dezider Grunberger (Institute of Cancer Research) were promoted to Associate Professor. Dr. Ronald L. Hanson joined our department as Assistant Professor.

Thirty graduate students in the Faculty of Pure Science as well as medical and dental students received instruction in biochemistry. The Ph.D. degree was awarded to eight of our graduate students.

A commemoration service was held for Professor Emeritus Hans T. Clarke, former chairman of the Department of Biochemistry from 1928 to 1956.

Dr. S. J. Singer from the Department of Biology, University of California, San Diego was invited to give a series of lectures covering membrane structure.

Amidst much security, a delegation of scientists from the Republic of China visited with our Chairman, Dr. Erwin Chargaff.

A series of lectures entitled biochemical relationships in medicine was introduced as an elective in the medical students course. This includes a discussion by a biochemist as well as a clinician.

Eight postdoctoral fellows joined our department for additional training.

Research

Drs. Ruth and Reinhold Benesch have extended their work on the interaction between pyridoxal phosphate and hemoglobin. An important recent result was the discovery that pyridoxal phosphate

which is highly specific for the N-terminal amino groups of the β chains in deoxyhemoglobin changes its affinity to the N-terminal groups of the α chains when the hemoglobin is liganded, e.g. in oxyhemoglobin. These termini are situated at opposite ends of the hemoglobin molecule. Further work is continuing on related compounds with selected specificity for known sites on the hemoglobin tetramer to observe their effects on the functional properties of the oxygen carrier.

Drs. Nobuji Maeda from Nara Medical College, Japan, and Christian Bauer from the Medical School in Hanover, Germany, participated in these studies. The monopyridoxylated derivative of deoxyhemoglobin was crystallized and is now under investigation in the laboratory of Dr. Max Perutz in Cambridge, England.

In addition, for the first time, hemoglobin hybrids of the type $\alpha_2\beta^x\beta^y$ have been isolated.

Dr. Ruth E. Benesch lectured at the University of Pennsylvania and Dr. Reinhold Benesch lectured at Roswell Park Memorial Institute in Buffalo.

Dr. Chargaff and his colleagues continued their study of cellular control mechanisms with particular emphasis on enzyme systems concerned with the synthesis of DNA and RNA and of their precursors. The main emphasis was placed on enzymes appearing in the course of cellular development.

The following participated in these studies: Dr. J. D. Karkas who also carried on independent

work which is mentioned elsewhere in this report; Dr. E. F. Brunngraber, Dr. S.-H. Chang, Dr. R. Ellouz, Dr. L. Margulies, Dr. R. Milanino, Dr. J. G. Stavrianopoulos.

Dr. Eisenberg is continuing his studies on the enzymes involved in biotin biosynthesis and their control. Mr. Gerald Stoner, a graduate student, has purified the transaminase enzyme almost to homogeneity and is exploring its properties. The mechanism of action of certain biotin analogues actithizic acid and α dehydrobiotin are also under investigation. Dr. Eisenberg was invited to write a chapter on biotin biosynthesis for the *Advances in Enzymology* to appear in 1973.

Dr. Feigelson's laboratory has continued its exploration of the biochemical processes underlying regulation of macromolecular metabolism in mammalian tissues. In the past year, rat hepatic tryptophan oxygenase was purified to homogeneity for the first time and studied in detail. This enzyme manifests an interesting allosteric control.

Dr. Allen M. Gold continued his studies on the structure and function of the enzyme polysaccharide phosphorylase, which plays a key role in the regulation of carbohydrate metabolism. Kinetic and structural studies on the nature of the active site of the enzyme were carried out in collaboration with Mrs. Hsiang Hu, Miss Eva Legrand and Mr. Frederick Mittelman. A program has been started to investigate the mechanism of ATP-dependent calcium transport in the sarcoplasmic reticulum of skeletal muscle, in collaboration with Mr. Michael Osber.

Dr. Graff and his associates, in collaboration with Dr. David V. Habib (Surgery), have continued their work on interferon with the objective of preparing, concentrating, and purifying sufficient amounts of this species-specific oncolytic agent for clinical trial in the human.

Dr. Dezider Grunberger, in collaboration with Dr. I. Bernard Weinstein, continued work on the elucidation of tRNA functions after modification with a potent carcinogen N-2-acetylaminofluorene. In collaboration with Dr. K. Nakanishi from the Department of Chemistry, Columbia University, the structure of a fluorescent base, termed "Y", located next to the 3'-end of the anticodon in tRNA^{Phe} from bovine liver was determined. Other collaborative efforts involved cooperation with Drs. J. and P. M. Pitha from Johns Hopkins School of Medicine, and Dr. E. Reich of Rockefeller University.

Dr. Karkas has continued his studies on the biosynthesis of nucleic acids. In collaboration with

Drs. Chargaff and J. G. Stavrianopoulos he investigated the priming of DNA polymerases by DNA-RNA hybrids. He also reported work on the coupling of replication to transcription *in vitro*.

Dr. Alvin I. Krasna has continued his studies on the effect of alkylation of DNA and RNA on their macromolecular and biological properties. With Dr. Natalia Trifunac, the effect of chemical methylation of transfer RNA has been studied. The enzymatic methylation of DNA is being studied with Mr. Jerrold Greenberg. Chemical methylation of DNA has been investigated with Mr. Eric Holwitt. The properties of homogeneous hydrogenase has been studied with Mr. Peter Gitlitz. With Dr. Richard Johnson, the contributions of the oxidative and non-oxidative pentose phosphate pathways in *E. coli* has been studied.

The laboratory under the direction of Dr. Seymour Lieberman, continues its studies of the biochemistry and metabolism of the steroid hormones. The following participated in this research work: Drs. Richard Hochberg, Patrick McDonald, Paula Zimmering, Laura Ponticorvo, Fred Chasalow, Wylie Hembree, Richard Ehrenkaufer. Three graduate students, working under the direction of Dr. Lieberman are continuing their research studies. Mrs. Violet Lippman is completing her investigation into the biosynthetic origin and mechanism of formation of the pheromones, the C₁₀- Δ^{16} steroids. Mr. Frank Gasparini is attempting to confirm the report that human breast cancer tissue can convert cholesterol into pregnenolone and androstenedione into estrogens. Miss Marie Monaco is attempting to determine the steroidal precursors of estrogens formed by rat testes.

Dr. Barbara W. Low and her associates continued work on the determination of the three-dimensional structures of erabutoxin a and b, in collaboration with Professor Nobuo Tamiya, Tohoku University, Japan. The studies have been extended to work on laticotoxin from *Laticauda laticaudata*. Collaborative work with Professor Dean D. Watt, Creighton University, Omaha, Nebraska, on the scorpion venom toxin from *C. sculpturatus* has also begun.

With Drs. Lawrence S. Rosen and W. Wardle Fullerton the X-ray crystallographic studies of proinsulin have led to the description of several new forms of both bovine and porcine proinsulin, as well as the co-crystallization of insulin/proinsulin.

Theoretical studies of protein conformation continue with Mr. Godfrey A. Crane.

Dr. Richard Moyer in collaboration with his graduate students is investigating episome and phage interaction within bacterial cells. Studies in collaboration with Charles Szabo have been completed on the mechanism of transcription of the bacteriophage T5 genome during infection of *E. coli* cells. The results suggest that the RNA polymerase enzyme from the host cell is used without modification for all phage transcription. Current studies concerned with the restriction of bacteriophage T5 growth by the colicin Ib factor have led to the discovery of an inhibition in the synthesis of certain classes of the phage specific messenger RNA's.

Work in collaboration with Ronald Herman has centered on the perfection of techniques for analysis of DNA by molecular weight in order to study phage RNA replication. The study of bacteriophage T5 DNA replication was then chosen as a system for investigation because one of the two strands of the phage DNA contains specifically located nicks and presents an advantageous system for the study of both the origin and the direction of replication.

In collaboration with Mrs. Eunice Wakatama and Miss Karen Johnson, Dr. Lawrence Skogerson has been investigating the site of inhibition of protein synthesis by cryptopleurine. In conjunction with these studies, mutants of yeast resistant to this inhibitor were isolated and found to have altered ribosomes. Genetic studies determined the map position of the mutation. Mrs. Usha Somasundaran has been examining the binding of initiator transfer RNA's to yeast ribosomes in an effort to isolate initiation factors.

Dr. David J. Smith continues his investigations of the nature of the chemical bonds responsible for the tensile and solubility properties of collagenous tissues. He has determined that a series of bifunctional protein reagents react with amino

acid sidechains near the ends of the tropocollagen molecule which appear to be involved in these tensile and solubility properties.

Dr. David B. Sprinson and his collaborators have continued investigations of regulatory mechanisms and enzymes of aromatic biosynthesis. These included regulation of tyrosine and phenylalanine biosynthesis, and the purification and mechanism of 3-deoxy-D-arabino-heptulosonate 7-phosphate synthetase. Work is also proceeding on the regulation of cholesterol biosynthesis in animal tissues and in yeast.

Participating in this work were Dr. M. Adlersberg, Dr. J. Dayan, Dr. E. Gollub, Dr. P. Trocha, Dr. U. S. Maitra and Mr. R. Hu.

Parithychery R. Srinivasan and his associates have continued their investigations on the regulation of RNA synthesis, on the biological function of methylated bases in nucleic acids and on the biosynthesis of anthranilic acid, partly in collaboration with Dr. Dorothy Srinivasan. Dr. Mahadik and Ben Dharmgrongartama, a graduate student, have isolated a protein from T3 phage infected *E. coli* cells which markedly inhibits *E. coli* RNA polymerase but not T3 specific T3 RNA polymerase.

Acknowledgment

The activities of the department received support during the year through grants from the American Cancer Society, the American Heart Association, the Atomic Energy Commission, E. I. duPont de Nemours and Company, the Health Research Council of New York, the Office of Naval Research, the National Institutes of Health of the United States Public Health Service, the National Science Foundation, the Rockefeller Foundation, Brown-Hazen Research Corporation, Smith, Kline and French Laboratories, and the Irma T. Hirsch Trust Fund.

1972 Publications

Biochemistry

- Beato, M.; Kalimi, M. and Feigelson, P.
Correlation between glucocorticoid binding to specific liver cytosol receptors and enzyme induction *in vivo*. *Biochim. Biophys. Res. Com.* **47**:1464-1472, 1972.
- Beato, M. and Feigelson, P.
Glucocorticoid binding proteins of rat liver cytosol, I. Separation and identification of the binding protein. *J. Biol. Chem.* **247**:7890-7896, 1972.
- Benesch, R. E.; Benesch, R.; Renthall, Robert D. and Gratzer, W.
Cofactor binding and oxygen equilibria in hemoglobin. *Nature New Biology* **234**:174-176, 1971.
- Benesch, R. E.; Benesch, R.; Renthall, Robert D. and Maeda, N.
Affinity labeling of the polyphosphate binding site of hemoglobin. *Biochemistry* **11**:3576-3582, 1972.
- Benesch, R. E.; Maeda, N. and Benesch, R.
2,3 Diphosphoglycerate and the relative affinity of adult and fetal hemoglobin for oxygen and carbon monoxide. *Biochim. Biophys. Acta.* **257**:178-182, 1972.
- Brady, F. O.; Forman, H. J. and Feigelson, P.
The role of superoxide and hydroperoxide in the reductive activation of tryptophan-2, 3-dioxygenase. *J. Biol. Chem.* **246**:7119-7123, 1971.
- Brady, F. O.; Monaco, M. E.; Forman, H. J.; Shutz, G. and Feigelson, P.
On the role of copper in activation and catalysis by tryptophan-2, 3-dioxygenase. *J. Biol. Chem.* **247**:7915-7922, 1972.
- Dexter, David D.
Procaine: A comparative study of two independent structure determinations; conformations in different solid-state environments. *Acta Cryst.* **B28**:77-82, 1972
The crystal and molecular structure of 2-dimethylaminoethyl selenolbenzoate hydrochloride. *Acta Cryst.* **B28**:49-54, 1972.
- Eisenberg, Max A. and Stoner, Gerald L.
Biosynthesis of 7,8-diaminopelargonic acid, a biotin intermediate, from 7-keto-8-aminopelargonic acid and S-adenosyl-L-methionine. *J. Bact.* **108**:1135-1140, 1971.
- Feigelson, P.; Hanoune, J. and Yu, F. L.
Effects of glucocorticoids on hepatic enzyme induction and purine nucleotide and RNA metabolism. In: *The Human Adrenal Cortex*. N. Christy, ed. T. H. Hober & Co., 1971.
- Forman, H. J. and Feigelson, P.
The effect of allosteric interactions on the kinetics, spectra, and tertiary structure of pseudomonad tryptophan oxygenase. *J. Biol. Chem.* **247**:256-259, 1972.
- Fujimura, Shinji; Grunberger, Dezider; Carvajal, Gloria and Weinstein, I. Bernard
Modifications of ribonucleic acid by chemical carcinogens. Modification of *Escherichia coli* formyl-methionine transfer ribonucleic acid with N-acetoxy-2-acetylaminofluorene. *Biochemistry* **11**:3629-3635, 1972.
- Glick, Jane M.; Kerr, Sylvia, J.; Gold, Allen M. and Shemin, David
Multiple forms of colicin E₃ from *Escherichia coli* CA-38 (col E₃, col I). *Biochemistry* **11**:1183-1188, 1972.
- Grunberger, D.; Ward, D. C. and Reich, E.
7-Deazanebularin: Coding properties of triplets and polynucleotides. *J. Biol. Chem.* **247**:720-724, 1971.
- Karkas, John D.
Coupling of replication to transcription *in vitro*. *Proc Natl. Acad. Sci. U.S.A.* **69**:2288-2291, 1972.
- Karkas, John D.; Stavrianopoulos, Jannis G. and Chargaff, Erwin
Action of DNA polymerase of I of *E. coli* with DNA-RNA hybrids as templates. *Proc. Natl. Acad. Sci. U.S.A.* **69**:398-402, 1972.
- Koblinsky, M.; Beato, M.; Kalimi, M. and Feigelson, P.
Glucocorticoid binding proteins of rat liver cytosol. II. Physical characterization and properties of the binding proteins. *J. Biol. Chem.* **247**:7897-7904, 1972.
- Krasna, A. I.
Changes in the light-scattering properties of DNA on denaturation. *J. Colloid and Interface Sci.* **39**:632-646, 1972.
- Krell, Kenneth; Gottesman, Max E.; Parks, John S. and Eisenberg, Max A.
Escape synthesis of the biotin operon in induced λ b2 lysogens. *J. Mol. Biol.* **68**:69-82, 1972.
- Low, Barbara W. and Spitz, Rose D.
Predictions of backbone conformational changes in abnormal haemoglobins. *Nature New Biology*, **237**:148-149, 1972.
- Luttrell, Brian; Hochberg, Richard; Dixon, W. Ross; McDonald, Patrick and Lieberman, Seymour
Studies on the biosynthetic conversion of cholesterol into pregnenolone: Side chain cleavage of a t-Butyl analog of 20 α -hydroxycholesterol, (20R)-20-t-Butyl-t-pregnene-3 β , 20-diol, A compound completely substituted at C-22. *J. Biol. Chem.* **247**:1462-1472, 1972.
- Mahadik, S. P.; Dharmgrongartama, B. and Srinivasan, P. R.
An inhibitory protein of *Escherichia coli* RNA polymerase in bacteriophage T3-infected cells. *Proc. Natl. Acad. Sci. U.S.A.* **69**:162-166, 1972.
- Mautner, Henry G.; Dexter, David D. and Low, Barbara W.
Conformational requirements of acetylcholine analogs and local anesthetics. *Nature New Biology* **238**:87-88, 1972.
- Moyer, R. W.; Fu, A. S. and Szabo, C.
Regulation of bacteriophage T5 development by Coli factors. *J. Virology* **9**:804-812, 1972.

- Nakanishi, Koji; Blobstein, Steven; Funamizu, Makoto; Furutachi, Nobuo; Van Lear, George; Grunberger, Dezider; Lanks, Karl W. and Weinstein, I. Bernard
Structure of the "Peroxy-Y base" from liver tRNA. *Nature New Biology* **234**:107-109, 1971
- Poillon, W. N. and Feigelson, P
Differential sedimentation studies of allosteric interactions in *Pseudomonas* tryptophan oxygenase. *Biochemistry* **10**:753-760, 1971.
- Reynolds, Fred; Grunberger, Dezider; Pitha, Josef and Pitha, Paula M.
Inhibition of cell-free protein synthesis by poly (9-vinyladenine), poly (1-vinyluracil), and the corresponding vinyl copolymer. *Biochemistry* **11**:3261-3266, 1972.
- Rodgers, Richard and Chargaff, Erwin
Nucleoside phosphotransferase from carrot: chemical characterization and investigation of catalytic sites. *J. Biol. Chem.* **247**:5448-5455, 1972.
- Rosen, Lawrence S.; Fullerton, W. Wardle and Low, Barbara W.
Proinsulin: Further crystallization and x-ray crystallographic studies of bovine and porcine prohormone. *Arch. Biochem. and Biophysics* **152**:569-573, 1972.
- Rosner, William and Hochberg, Richard
Corticosteroid-binding globulin in the rat: isolation and studies of its influence on cortisol action *in vivo*. *Endocrinol.* **91**:626-632, 1972.
- Rudko, Andrew D.
The crystal structure of S-benzyl-L-cysteine-L-Prolyl-L-leucyl-glycinamide and its selenol analog. Ph.D Thesis Columbia University, 1972.
- Schutz, G.; Chow, E. and Feigelson, P
Regulatory properties of hepatic tryptophan oxygenase. *J. Biol. Chem.* **247**:5333-5337, 1972.
- Schutz, G. and Feigelson, P.
Purification and properties of rat liver tryptophan oxygenase. *J. Biol. Chem.* **247**:4327-5332, 1972.
- Thermal activation of hepatic tryptophan oxygenase enabling expression of total enzyme activity. *Analytical Biochemistry* **46**:149-155, 1972.
- Schutz, G.; Beato, M. and Feigelson, P.
Isolation of eukaryotic messenger RNA on cellulose and its translation *in vitro*. *Biochem. Biophys. Res. Comm.* **49**:680-689, 1972.
- Stavrianopoulos, Jannis G.; Karkas, John D. and Chargaff, Erwin
DNA polymerase of chicken embryo: purification and properties. *Proc. Natl. Acad. Sci., U.S.A.* **69**:1781-1785, 1972.
- Mechanism of DNA replication by highly purified DNA polymerase of chicken embryo. *Proc. Natl. Acad. Sci., U.S.A.* **69**:2609-2613, 1972.
- Tamir, Hadassah and Srinivasan, P. R.
Studies of the mechanism of anthranilate synthase evidence for an acyl-enzyme. *J. Biol. Chem.* **247**:1153-1155, 1972.
- Young, Delano V. and Srinivasan, P. R.
Regulation of macromolecular synthesis by putrescine in a conditional *Escherichia coli* putrescine auxotroph. *J. Bacteriol.* **112**:30-39, 1972.
- Yu, F. L. and Feigelson, P.
Cortisone stimulation of nucleolar RNA polymerase activity. *Proc. Nat. Acad. Sci.* **68**:2177-2180, 1972.
- The paper disc estimation of radioactive RNA: studies on the presence and elimination of metabolically generated artifacts from labelled purine and pyrimidine precursors. *Analytical Biochem.* **39**:319-321, 1971.
- On the rapid turnover of rat liver nucleolar RNA polymerase and its messenger RNA. *Proc. Natl. Acad. Sci.* **69**:2833-2837, 1972.
- Studies on the role of ammonium sulfate in nuclear transcription *in vitro*. *Biochim. Biophys. Acta* **272**:119-123, 1972.

Dermatology

CARL T. NELSON

Professor and Chairman of the Department • Director of Service

Teaching

The teaching program of the Department of Dermatology underwent no major changes during the past year. We continued our efforts to seek closer cooperation with the basic science departments and to introduce clinical dermatology as early as possible to undergraduate students. Dr. Saul L. Sanders remained in overall charge of our teaching plan with Dr. Alex W. Young, Jr. supervising the program at St. Luke's Hospital Center. Out-patient clerkships as well as externships in dermatology have been in demand during the elective period. Limited teaching facilities and personnel at this time, however, make it difficult to provide elective training for all students who may desire it.

Changes in Staff

Effective July 1, 1972, Dr. Lewis Shapiro became Clinical Professor of Dermatology and Pathology. Drs. Joseph A. Penner and Jack H. Rozen were promoted to Assistant Attending Dermatologists in Vanderbilt Clinic.

Appointees to the staff of the College of Physicians and Surgeons during 1972 were Dr. Wei-Li Lee as Research Associate and Drs. W. Ralph Barbce, Loren E. Golitz, Joseph S. Shapiro, and David Sibulkin as Assistants. Dr. Lester T. Recse, Assistant in Dermatology, and Dr. Luis Suarez-Reyes, Assistant Dermatologist, Vanderbilt Clinic, resigned during the year.

Staff Honors and Activities

Dr. Helen O. Curth participated in the XIVth International Congress of Dermatology held in

Venice and Dr. J. Lowry Miller continued to serve as Treasurer of the Dermatology Foundation. Dr. Joseph S. Shapiro continued as a member of the Executive Committee of the New Jersey Dermatological Society. Dr. Lewis Shapiro was co-chairman of the course on histopathology of the skin given at the annual meeting of the American Academy of Dermatology. He also was guest dermatopathologist at the annual meeting of the South-eastern Dermatological Society.

Dr. Margarita Silva-Hutner again served as a member of the Technical Advisory Committee of the American Type Culture Collection. Dr. Sanders was appointed to the Division of Education and Communication of the National Program for Dermatology and Dr. Eugene W. Sweeney was elected President of the Metropolitan Dermatological Society. Dr. Richard A. Walzer continued as a member of the Committee on Residency Training of the National Program for Dermatology. Dr. Carl T. Nelson was Chairman of the Committee on Education of the American Academy of Dermatology. He also served as President of the Association of Professors of Dermatology.

Patient Care

During 1972 out-patient visits to dermatology totalled 22,235, a decrease of 1,172 compared to the previous year. There were 106 admissions to the dermatology ward and 403 additional in-patients were seen in consultation with other services.

As has been emphasized previously, decreases in our clinic population cause us considerable

worry. A continued flow of large numbers of ambulatory patients with skin diseases are needed to yield sufficient cases of teaching value for our students and house staff. Continued efforts must be made to improve the care of patients in Vanderbilt Clinic and to achieve better continuity of follow-up.

Research

Dr. Jack Eisert and Dr. Sanders, with Dr. Lowell M. Greenbaum (Pharmacology) and Dr. Toru Niinaka (Osaka University Hospital) have undertaken a study of the properties of white cells of patients with psoriasis. Dr. Niinaka is a Visiting Research Associate in Pharmacology, assigned to Dermatology, who brings with him an expertise on methodology in the study of chemotaxis. His investigations are designed to determine if the white cells and serum chemotactic factors in psoriatics differ from those of normals. This work has been made possible by a gift from Mr. Arthur C. Merrell.

Mrs. Julia M. Einbinder, Dr. John R. Reeves and Dr. Loren E. Golitz undertook a survey of the presence of circulating antibodies to either intercellular squamous epithelial substances or to epidermal basement membrane in the sera of patients with bullous diseases. Immunofluorescent techniques were used in this investigation. With Dr. Lloyd and Dr. Walzer, Mrs. Einbinder also has initiated studies of an *in vitro* model to assess the significance of both intercellular antibody and the cellular immune system in the pathogenesis of pemphigus. This work has been supported by a generous gift from the estate of Ethel Weil.

Dr. James P. Fields continued an investigation of the value of clofazimine (B-663) in the treatment of leprosy and lepra reactions. He also continued studies on abnormalities of delayed hypersensitivity in patients with this disease. Dr. Kenneth O. Lloyd studied further the immunochemistry of fungal carbohydrate antigens. A peptido-phospho-polysaccharide from the cell wall of *Cladosporium werneckii* was investigated in detail and the manner in which these three components are organized into a covalent complex has been elucidated. With Dr. Wei-Li Lee, Dr. Lloyd has also

initiated a study of the immunological reactivity of *C. albicans* antigens. Also underway with Mr. T. V. Darnule is a study of the surface antigens of epidermal cells, with particular reference to their involvement in pemphigus.

Dr. Margarita Silva-Hutner continued an investigation of the effects of bacterial extracts on the cell walls of pathogenic yeasts. Cell free extracts of a strain of *arthrobacter* gave effective digestion of the cell walls of *Candida tropicalis*, a known human pathogen. Dr. William G. Merz and Dr. Silva-Hutner continued their studies on the behavior of pathogenic dimorphic fungi in mammalian tissue culture systems. With Miss Carole Berger, Drs. Merz and Silva-Hutner also completed an investigation of the effects of cycloheximide and temperature on the growth of *Aspergillus fumigatus*. Dr. Merz and Dr. Lloyd in addition pursued further the purification and characterization of antigens of pathogenic *Aspergillus* species to be used in serological diagnosis.

Dr. Luiz R. Travassos, Visiting Fellow from the Instituto de Microbiologica, Universidade Federal do Rio de Janeiro, Brazil, completed a study of the nutritional requirements of 75 strains of psychrophobic and non-psychrophobic yeasts. He also developed a microbiological method for assaying carnitine by determining the growth response of a carnitine-requiring mutant of *Torulopsis bovina* to several esters of carnitine. Dr. Travassos in addition has undertaken a comparison of the alkali-soluble polysaccharides from *Sporothrix schenckii* with those from *Ceratocystis* spp. An analysis of the fine structure of the polysaccharide macromolecules is being conducted by methylation techniques and other chemical and spectroscopic methods.

Acknowledgments

The Department of Dermatology gratefully acknowledges the financial support given its research program by the Brown-Hazen Fund of the Research Corporation, the Robert Sterling Clark Foundation, Duke Laboratories Foundation, Dr. Elizabeth L. Hazen, Mr. Arthur Ross, the estate of Ethel Weil, and the various agencies of the National Institutes of Health.

1972 Publications

Dermatology

- Bullock, Ward E.; Fields, James P. and Bandriss, Michael W.
An evaluation of transfer factor as immuno-therapy for patients with lepromatous leprosy. *New England J. Med.* **287**:1053-1059, 1972.
- Carrion, Arturo L. and Silva-Hutner, Margarita
Chromoblastomycosis: In: *Clinical Dermatology*. D. J. Demis, R. G. Crounse, R. L. Dobson and J. S. McGuire, eds., Harper and Row, New York, 1972.
- Curth, Helen O.
Jahresversammlung der American Academy of Dermatology in Chicago, 1971. *Derm. Monatschr.* **158**: 529-531, 1972.
Acanthosis nigricans. In: *The Third Conference on Clinical Delineation of Birth Defects. Part XII, Skin, Hair and Nails*. D. Bergsma, ed., The Williams and Wilkins Company, Baltimore, 1972.
- DeVoe, Arthur G. and Silva-Hutner, Margarita
Fungal infections of the eye. In: *Microbiology of the Eye*. D. Locatcher-Khorazo and B. C. Seegal, eds., The C. V. Mosby Co., St. Louis, 1972.
- Golitz, Loren E. and Fields, James P.
Metastatic calcification and skin necrosis. *Arch. Derm.* **106**:398-402, 1972.
- Kroll, Jeffrey J. and Walzer, Richard A.
Paracoccidioidomycosis in the United States. *Arch. Derm.* **106**:543-546, 1972.
- Lloyd, Kenneth O.
Molecular organization of a covalent peptido-phosphopolysaccharide complex from the yeast form of *Cladoseorium werneckii*. *Biochemistry* **11**:3884, 1972.
- Merz, William G.; Lloyd, Kenneth O. and Silva-Hutner, Margarita
Characterization of a *Trichophyton mentagrophytes* and its diffusible pigment. *Sabouraudia* **10**:86-93, 1972.
- Nelson, Carl T.
Sarcoidosis. In: *Clinical Dermatology*. D. J. Demis, R. G. Crounse, R. L. Dobson and J. S. McGuire, eds., Harper and Row, New York, 1972.
- Rosenberg, Frederic R.; Einbinder, Julia M.; Walzer, Richard A. and Nelson, Carl T.
Vegetating iododerma: An immunological mechanism. *Arch. Derm.* **105**:899-905, 1972.
- Sibulkin, David and Cohen, Harvey J.
Oral mucosal erosions. *Oral Med.* **34**:202-204, 1972.
- Travassos, Luiz R. and Mendonca, Lucia
Vitamin requirements and induced nutritional imbalances as criteria in speciating psychrophobic yeasts. *Antonie van Leeuwenhoek J. Microbiol. Serol.* **38**:379-389, 1972.
- Travassos, Luiz R.
Communication on the joint activities of the Instituto de Microbiologia, Universidade Federal do Rio de Janeiro, Brazil, and the Department of Dermatology, Columbia University. In: *Yeast News Letter*. H. J. Phaff, ed., **20** (2):14-16, July, 1972.
- Travassos, Luiz R., Mendonca, Lucia and Cury, Amadeu
Vitamin requirements and induced nutritional imbalances as criteria for definition of *Candida slooffii* and other psychrophobic yeasts. In: *Bacteriological Proceedings, 72nd Annual Meeting of the Am. Soc. Microbiology*, Philadelphia, 1972.
- Walzer, Richard A.; Feinstein, Robert; Shapiro, Lewis and Einbinder, Julia M.
Severe hypersensitivity reaction to gold. *Arch. Derm.* **106**:231-234, 1972.
- Young, Jr., Alex W.; DiGrande, Elaine V. and Wagers, Lawrence T.
Skin stigmata of adolescent drug addiction. *Modern Treatment* **9**:117-136, 1972.
- Young, Alex W. Jr.; Wagers, Lawrence T. and Ryan, Stephen F.
Linear melorheostotic scleroderma. *Brit. J. Derm.* **86**:297-301, 1972.
- Young, Alex W. Jr.
Herpes genitalis. In: *The Medical Clinics of North America*. Bruce Webster, M.D., ed., W. B. Saunders Company, Philadelphia, 1972.

Human Genetics and Development

ROBERT S. KROOTH

Professor and Chairman of the Department

Teaching

The Department of Human Genetics and Development is in the third full year of its Ph.D. program in the University's Graduate School of Arts and Sciences. The department offers graduate instruction and research experience in nearly all areas of human genetics and in several important fields of the biochemistry of development and cell differentiation. In addition, the faculty provides postdoctoral education for physicians and scientists interested in genetics, development, and reproduction.

The formal courses offered by the department include (1) a survey of the medical application of human genetics — a series of lectures intended primarily for sophomore medical students and graduate students in the department; (2) a more detailed and extensive course of about 120 hours of lectures covering all aspects of human genetics and several of the newer areas of developmental biology. In addition, a course in teratology and a course in methods of human genetics have recently been added to the curriculum.

Staff Changes

On July 1, 1972, Dr. Robert S. Krooth assumed the chairmanship of the department. Dr. John D. Rainer has been appointed Professor of Clinical Psychiatry in the Department of Human Genetics

and Development as well as in the Department of Psychiatry. Dr. Arthur Bank has been appointed an Associate Professor of Human Genetics and Development, and Dr. Daniel L. Kacian has been promoted to Assistant Professor of Human Genetics and Development. Drs. Rudiger Hehlmann, Donald W. Kufe, and Fred R. Kramer were appointed as Instructors.

Dr. David M. Chui who had been an Instructor in the department has taken a position at McMaster University, Hamilton, Ontario, Canada; Dr. Masaaki Terada, formerly an Instructor, has taken a position at Kyoto University, Japan. Dr. Kenneth Watson, previously an Instructor has taken a position in the Department of Virology, the Robert Koch Institute, Berlin, Germany with Dr. Heinz Bauer.

Post-doctoral fellows in the department include Drs. Linda Cantor and Leslie Johnson. Research Associates include Drs. Penelope Allderdice, Vaitilingam G. Dev, Ann S. Henderson, Donald J. Komma, Pamela Malpoix, Dorothy A. Miller, Francesco Ramirez, and Ming Tsung Yu; Julia B. Jones, Selina C. Kiang, and George Lam are also Research Associates. Dr. Roberto Gambino is a Staff Associate. Pre-doctoral fellows include Almira Cann, David Colcher, Subhash Gulati, Shahnaz Hashmi, Deborah Katz, Florence Maisonrouge, Julien Mendlewicz, Robert Muller, Ruth Ruprecht, Rhona Shreck, and Deborah Vogelmann.

Research Activities

Dr. Kimball Atwood has now identified the human chromosomes which carry the genes for ribosomal RNA, and has made progress in identifying in a rigorous way the chromosomal location of at least some of the structural genes for human hemoglobin. In addition, Dr. Atwood is continuing his studies on the possible effects of mutations at the *t*-locus in mice on the number of genes which encode for ribosomal RNA.

The laboratory of Dr. Georgiana Jagiello has continued long-term studies on mammalian meiosis. Detailed assessment of the evolution of chiasmata frequencies, disjunctional behavior and structural heterozygosity in female mammals has been continued. *Macaca mulatta*, *Macaca nemestrina*, *Ovis aries*, *Felis catus*, *Canis familiaris*, and the C⁵⁷ L/J (polycystic) and C⁵⁸/J (polyovular) mice have been studied. In addition, the mouse translocation (*T*(:13)70*H*) was studied in collaboration with Dr. Orlando J. Miller's group.

Dr. Elvin Kabat, in collaboration with Dr. O. J. Miller, has made progress in his effort to identify the human chromosome carrying the genes which determine the ABO blood group variation.

Dr. Krooth and his associates have just completed a program of experimentation on purine metabolism in cultured cells. In addition, they have made significant progress in studies aimed at clarifying the control of the enzymes of galactose metabolism in cell strains from normal persons and from persons with inborn metabolic errors affecting the catabolism of galactose. They have also developed, and are presently testing, a new theory for the mode of action of the barbiturates, and are continuing experiments using somatic cell hybridization to inquire into the regulation of tissue-specific function in human cells.

Dr. O. J. Miller and his associates have continued their studies of translocations in the mouse and have been able to establish more firmly the assignment of 14 of the 19 known linkage groups in the mouse to 14 specific chromosomes, as described in the previous report. They have used quinacrine fluorescent banding techniques to identify the chromosomes in other species and have shown their value in heteroploid cell lines. In collaboration with Dr. Bernard F. Erlanger and the late Dr. Sam M. Beiser of the Department of Microbiology, Dr. Miller and his associates, Dr. V. G. Dev and Dr. Dorothy Warburton, have shown that one can produce consistent and characteristic chromosome banding patterns by an immunofluorescent technique, using antibodies specific to adenosine.

Dr. John Rainer at the Psychiatric Institute has conducted or supervised genetic studies on several aspects of manic depressive psychosis. Some of these studies have been carried out by Dr. Julien Mendlewicz in collaboration with an interdisciplinary depression research team headed by Dr. Ronald Fieve. Evidence has been obtained which strongly suggests that a dominant X-linked gene may account for a significant fraction of cases of manic depressive psychosis. Dr. Mihalay Bartalos at the Psychiatric Institute has developed a new method of differential staining of human chromosomes, employing the use of an ammoniacal silver procedure which stains non-DNA components.

Dr. Richard Rifkind, with Dr. Linda Cantor, has been studying the nature of the precursor for erythropoietic differentiation in the fetal liver. These precursors may be isolated by immunological methods, and, when cultured in the presence of the hormone erythropoietin, are induced to differentiate into mature erythroid cells.

Dr. Paul A. Marks, in association with Dr. Rifkind, Dr. Cantor, Dr. Arthur Bank and Dr. Masaaki Terada, has studied the molecular basis of this induction of differentiation. The precursor cell does not synthesize hemoglobin nor does it contain mRNA for globin. Following hormone stimulation globin mRNA appears and hemoglobin is produced.

Dr. George Maniatis has investigated the nature of the RNA species which are synthesized in response to erythropoietin and is presently studying the nature of gene products in a malignant erythroid cell line infected by an oncogenic virus.

Dr. Arthur Bank and his associates have shown that in hemoglobin H disease, a form of alpha thalassemia, an abnormality can be demonstrated in the mRNA for hemoglobin.

Dr. Sol Spiegelman and his collaborators concentrated on the relevance of animal viral oncology to human cancer. Drs. R. Hehlmann, D. Kufe, and W. Baxt have been examining human leukemias, lymphomas, and sarcomas for evidence of a viral agent. They have now demonstrated in all of these diseases that the neoplastic cells contain RNA related to that of a mouse leukemogenic virus. They have further demonstrated that the tumor-specific RNA of humans is of large molecular weight and associated with a reverse transcriptase in a particle possessing the physical properties characteristic of the animal RNA tumor viruses.

Drs. J. Schlom and R. Axel and Mr. S. Gulati have carried out similar studies on human breast cancer. Here again, a tumor-specific RNA is found which is related in sequence to the mouse mammary

tumor virus. In this case also, it was possible to demonstrate that the RNA in the human tumor was encapsulated with a reverse transcriptase in virus-like particles.

Drs. D. Mills, F. Kramer, T. Nishihara, and P. Cole have continued their studies of the extracellular evolution of a replicating RNA molecule. Over the past year they have concentrated on obtaining the complete sequence of a particular variant and this goal has now been achieved. It will now be possible for the first time to specify with complete precision the base changes required to mutate from one phenotype to another in the course of extracellular Darwinian selection experiments.

Drs. Kacian and Spiegelman, in cooperation with Drs. Bank, Terada, Metafora, Dow and Marks, have been working on the *in vitro* synthesis of the genes for human globins. Avian myeloblastosis virus reverse transcriptase has been shown to use human globin mRNA as a template.

Dr. Sidney Udenfriend and his associates are engaged in purifying enzymes of the nervous system. They have recently identified a protein peculiar to the olfactory region of the brain. In addition they have developed immunoassays for a number of important drugs ("immunopharmacology") such as morphine and the barbiturates. They also have a program for inquiring into the relationship between enzyme structure and enzyme function, especially with respect to the enzymes of carbohydrate metabolism. Finally, they have developed a set of new and remarkably sensitive enzyme assays using modern fluorometric techniques.

Dr. Dorothy Warburton has developed a technique of Giemsa-banding using pretreatment with trypsin-EDTA. This, as well as quinacrine fluorescence, has been used to identify new human chromosomal abnormalities such as a familial interstitial translocation, a dicentric non-reciprocal translocation and a Y deletion in the marrow of a patient with erythremic myelosis.

Dr. Arthur Weissbach is investigating the en-

zymatic mechanism of DNA synthesis in animal and human cells. These studies include a characterization of the DNA polymerases found in normal, viral infected, and tumor cells.

Dr. Herbert Weissbach's main interest is the mechanism of protein synthesis. Elongation factors from both animal and bacterial sources have been purified and their interactions with aminoacyl-tRNA and ribosomes are under study. In addition, proteins on the 50S ribosomal subunit, which are involved in the elongation process, are under investigation. Knowledge of the translation process is being used in studies aimed at purifying an *in vitro* system capable of synthesizing specific proteins directed by DNA.

Clinical Service

The department maintains a small clinical laboratory, under the immediate direction of Dr. Dorothy Warburton, for medical cytogenetics. In addition, several members of the department on an informal basis counsel patients who have, or believe they have, hereditary diseases in their family. However, this service is presently rendered on an extremely small scale. We anticipate that within the next 24 months, the department will be able to provide, in some form, a more expanded consultant service to patients in the medical center who are referred either for counselling or for the verification of a suspected enzymatic or chromosomal abnormality.

Acknowledgments

The Department of Human Genetics and Development is grateful for the generosity of the following donors: Atomic Energy Commission; National Institutes of Health; National Science Foundation; American Cancer Society; Cooley's Anemia Blood and Research Foundation for Children, Inc.; Leukemia Society, Inc.; RGK Foundation; Robert Lehman Foundation; Roche Institute of Molecular Biology; Rockefeller Foundation; Mr. and Mrs. John Galt.

1972 Publications

Human Genetics and Development

- Axel, R.; Schlom, J. and Spiegelman, S.
Evidence for translation of viral-specific RNA in cells of a mouse mammary carcinoma. *Proc. Natl. Acad. Sci.* **69**:535-538, 1972.
Presence in human breast cancer of RNA homologous to mouse mammary tumor virus RNA. *Nature*, **235**:32-36, 1972.
- Bartalos, M. and Rainer, J. D.
Ammoniacal silver as a differential stain for human metaphase chromosomes. Abs. In: *Tenth Annual Somatic Cell Genetics Conference*. Aspen, Colorado, 1972.
- Breg, W. R.; Allderdice, P. W.; Miller, D. A. and Miller, O. J.
Quinacrine fluorescence patterns and terminal DNA labelling of human C group chromosomes. *Nature, New Biol.* **236**:76-78, 1972.
- Breg, W. R.; Miller, D. A.; Allderdice, P. W. and Miller, O. J.
Identification of translocation chromosomes by quinacrine fluorescence. *Am. J. Dis. Child* **123**:561-564, 1972.
- Cantor, L. N.; Morris, A. J.; Marks, P. A. and Rifkind, R. A.
Purification of the erythropoietin-responsive cell by immune hemolysis. *Proc. Natl. Acad. Sci.* **69**:1337, 1972.
- Christenson, J. G.; Dairman, W. and Udenfriend, S.
On the identity of dopa decarboxylase and 5-Hydroxytryptophan decarboxylase. *Proc. Nat. Acad. Sci.* **69**:343-347, 1972.
- Dev, V. G.; Miller, D. A.; Allderdice, P. W. and Miller, O. J.
Method for locating the centromeres of mouse meiotic chromosomes and its application to T163H and T70H translocation. *Exp. Cell. Res.* **73**:259-262, 1972.
- Dev, V. G.; Warburton, D. and Miller, O. J.
Giemsa banding of chromosomes. *Lancet* **I**:1285, 1972.
- Dev, V. G.; Warburton, S.; Miller, O. J.; Miller, D. A.; Erlanger, B. F. and Beiser, S. M.
Consistent pattern of binding of anti-adenosine antibodies to human metaphase chromosomes. *Exp. Cell Res.* **75**:288-293, 1972.
- Djaldetti, M.; Bessler, H. and Rifkind, R. A.
Hematopoiesis in the embryonic mouse spleen: An electron microscopic study. *Blood* **39**:826, 1972.
- Djaldetti, M.; Preisler, H.; Marks, P. A. and Rifkind, R. A.
Erythropoietin effects on fetal mouse erythroid cells: II. Nucleic acid synthesis and the erythropoietin-sensitive cell. *J. Biol. Chem.* **247**:731, 1972.
- Fridlender, B. and Weissbach, A.
Tumor virus DNA polymerases, specific effect of ethidium bromide on the utilization of different synthetic templates. *Proc. Nat. Acad. Sci.* **69**:452, 1972.
- Grzeschik, K. H.; Allderdice, P. W.; Grzeschik, A.; Optiz, J. M.; Miller, O. J. and Siniscalco, M.
Cytological mapping of human X-linked genes by use of somatic cell hybrids involving an X-autosome translocation. *Proc. Natl. Acad. Sci.* **69**:74-77, 1972.
- Gulati, S. C.; Axel, R. and Spiegelman, S.
Detection of RNA-instructed DNA polymerase and high molecular weight RNA in malignant tissue. *Proc. Nat. Acad. Sci.* **69**:2020-2024, 1972.
- Hartman, B. K. and Udenfriend, S.
The application of immunological techniques to the study of enzymes regulating catecholamine synthesis and degradation. *Pharm. Rev.* **24**:311-330, 1972.
- Hartman, B. K.; Zide, D. and Udenfriend, S.
The use of dopamine- β -hydroxylase as a marker for the central noradrenergic nervous system in rat brain (Immunofluorescence / microcirculation / norepinephrine). *Proc. Nat. Acad. Sci.* **69**:2722-2726, 1972.
- Hehlmann, R.; Kufe, D. and Spiegelman, S.
RNA in human leukemic cells related to the RNA of a mouse leukemia virus. *Proc. Nat. Acad. Sci.*, **69**:435-439, 1972.
Viral-related RNA in Hodgkins' disease and other human lymphomas. *Proc. Nat. Acad. Sci.* **69**:1727-1731, 1972.
- Howard, P. N.; Bloom, A. D. and Krooth, R. S.
Chromosomal aberrations induced by N-methyl-N'-nitro-N-nitrosoguanine in mammalian cells. *In Vitro* **7**:359-365, 1972.
- Kacian, D. L.; Mills, D. R.; Kramer, F. R. and Spiegelman, S.
A replicating RNA molecule suitable for a detailed analysis of extracellular evolution and replication. *Proc. Nat. Acad. Sci.* **69**:3038-3042, 1972.
- Kacian, D. L.; Spiegelman, S.; Bank, A.; Terada, M.; Metafora, S.; Dow, L. and Marks, P. A.
In vitro synthesis of DNA components of human genes for globins. *Nature New Biology*, **235**:167-169, 1972.
- Kaney, A. R. and Atwood, K. C.
Incompatibility of integrated sex factors in double male strains of *E. Coli*. *Genetics* **70**:31-39, 1972.
- Kufe, D.; Hehlmann, R. and Spiegelman, S.
Human sarcomas contain RNA related to the RNA of a mouse leukemia virus. *Science*, **175**:182-185, 1972.
- Maniatis, G. M. and Ingram, V. M.
Effect of phenylhydrazine-induced anemia on the appearance of adult hemoglobin in *Rana Catesbeiana* tadpoles. *Develop. Biol.* **27**:580, 1972.
- Marks, P. A.
Erythroid cell differentiation. *Harvey Lecture Series* **66**:43, 1972.
Health systems research in the mainstream of academic medicine. *J. Clin. Invest.* **51**:1606-1610, 1972.
- Marks, P. A. and Rifkind, R. A.
Control of protein synthesis in erythropoiesis. *Science* **175**:955, 1972.

- McGee, J. O'D. and Udenfriend, S.
A general method for the rapid measurement of enzyme precursors by the displacement of enzyme from antibody: The measurement of collagen proline hydroxylase precursor in cultured fibroblasts. *Biochem. & Biophys. Res. Commun.* **46**:1646-1653, 1972.
- McGee, J. O'D. and Udenfriend, S.
Partial purification and characterization of peptidyl proline hydroxylase precursor from mouse fibroblasts. *Arch. Biochem. Biophys.* **152**:216-221, 1972.
- Mendlewicz, J.; Fieve, R. R.; Rainer, J. D. and Fleiss, J. L.
Manic-depressive illness: A comparative study of patients with and without a family history. *Brit. J. Psychiat.* **120**:523-530, 1972.
- Mendlewicz, J.; Fieve, R. R.; Stallone, F. and Fleiss, J. L.
Genetic history as predictor of lithium response in manic-depressive illness. *Lancet*, **i**:599-600, 1972.
- Metafora, S.; Terada, M.; Dow, L. W.; Marks, P. A. and Bank, A.
Increased efficiency of exogenous mRNA translation in a Krebs ascites cell-free system. *Proc. Nat. Acad. Sci.* **69**:1299-1303, 1972.
- Minio, F.; Howe, C.; Hsu, K. C. and Rifkind, R. A.
Antigen density on differentiating erythroid cells. *Nature*, **237**:187, 1972.
- Nagatsu, T. and Udenfriend, S.
Photometric assay of dopamine- β -hydroxylase in activity in human blood. *Clin. Chem.* **18**:980-983, 1972.
- Rainer, J. D.
Genetics and psychiatry. In: *Human Behavior, Biological, Psychological and Sociological*. A. Freedman and H. Kaplan, eds., Atheneum, New York, 1972.
- Rainer, J. D.; Abdullah, S. and Jarvik, L. F.
YYY karyotype in a pair of monozygotic twins: A 17-year life-history study. *Brit. J. Psychiat.* **120**:543-548, 1972.
- Schlom, J.; Spiegelman, S. and Moore, D. H.
Detection of high molecular weight RNA in particles from human milk. *Science*, **175**:542-544, 1972.
Reverse transcriptase and high molecular weight RNA in particles from mouse and human milk. *J. Natl. Cancer Inst.*, **48**:1197-1203, 1972.
- Shapiro, L. and Warburton, D.
Familial interstitial translocation. *Lancet* **2**:712, 1972.
- Spiegelman, S.
Discussion to viral oncology. In *Nucleic Acid-Protein Interactions*. D. W. Ribbons, J. F. Woessner and J. Schultz, eds., North-Holland Publishing Co., Amsterdam, 1972.
- Spiegelman, S.; Axel, R. and Schlom, J.
Virus-related RNA in human and mouse mammary tumors. *J. Natl. Cancer Inst.* **48**:1205-1211, 1972.
- Spiegelman, S. and Schlom, J.
Reverse transcriptase in oncogenic RNA viruses. In: *Virus-Cell Interactions and Viral Antimetabolites*. D. Shugar, ed. Academic Press, London, (FEBS Symposium), 1972.
- Terada, M.; Metafora, S.; Banks, J.; Dow, L. W.; Bank, A. and Marks, P. A.
Conservation of globin messenger RNA in rabbit reticulocyte monoribosomes after sodium fluoride treatment. *Biochem. Biophys. Res. Comm.* **47**:766, 1972.
- Udenfriend, S.
Molecular biology of the sympathetic nervous system. *Pharm. Rev.* **24**:165-166, 1972.
- Warburton, D. and Miller, O. J.
Present status and future trends in prenatal diagnosis of chromosomal disorders. *Clin. Obst. Gynec.* **15**:272-282, 1972.
- Weissbach, A.; Bolden, A.; Muller, R.; Hanafusa, H. and Hanafusa, T.
DNA polymerase activities in normal and leukovirus infected chick embryo cells. *J. Virology* **10**:321-327, 1972.

Medicine

CHARLES A. RAGAN

Lambert Professor and Chairman of the Department

Director of Service

The trends noted in last year's annual report towards interdepartmental efforts are continuing. Federal financing in categorical disease patterns and emphasis on ambulatory care and family practice training strengthen these trends and serve to weaken the traditional departmental structure. The future may see a proliferation of inter-departmental institutes leaving as departmental functions solely those of housekeeping and staffing at the lower echelons. The Department of Medicine continues to watch these trends carefully and for the immediate future, hopes to maintain its broadbased excellence in the three vital areas of service, teaching and research.

Teaching

Changes in Staff

Dr. David Seegal died on July 24, 1972 after a long illness at the age of 73. Dr. Seegal was associated with Columbia and Presbyterian for more than fifty years. His service at Goldwater Memorial Hospital was renowned for its teaching and for its innovative studies of chronic disease.

Dr. Dana W. Atchley was awarded an honorary doctorate by the Universite Louis Pasteur, Strasbourg. Dr. Elliott F. Osserman was awarded the Ehrlich Medal of the International Society of Hematology. Dr. Julia M. Jones was awarded the Trudeau Medal of the American Thoracic Society. Dr. Hamilton Southworth completed two years as president of the Medical Board of Presbyterian Hospital.

Drs. Marianne J. Leggato, John T. Bigger, Jr. and David T. McConnell have been awarded Research Career Development Awards from the National Institutes of Health. Drs. Vincent P. Butler, Jr. and John N. Loeb have been awarded Hirschl Fellowships. Dr. Roger L. Lerner was appointed Senior Investigator of the New York Heart Association.

Dr. Hymie L. Nossel serves on three editorial boards; Dr. Richard A. Rifkind on one; Dr. Robert E. Canfield on one; Dr. John T. Bigger on one; and Dr. M. Irene Ferrer on two. Dr. DeWitt S. Goodman completed his term as editor of the *Journal of Clinical Investigation* in May.

Dr. Peter R. Holt was president of the New York Gastroenterological Association; Dr. Dudley F. Rochester is president-elect of the eastern section of The American Thoracic Society; Dr. John F. Bertles is president of the New York Society for the Study of Blood; Dr. E. Carwile Le Roy is president-elect of the New York Rheumatism Association; Dr. Gerald E. Thomson is president of the Society of Urban Physicians and is president-elect of the New York Society of Nephrology and Dr. Sidney C. Werner is president of the American Thyroid Association.

Drs. John F. Bertles, Arthur Bank, Nicholas P. Christy, Robert B. Case, Harvey J. Weiss, I. Bernard Weinstein, John H. Laragh, John T. Bigger, S. A. Hashim, Gerald M. Turino and Harry W. Fritts, Jr., serve on study sections or training grant

committees of the National Institutes of Health in the categorical areas of their interest. Dr. Theodore B. Van Itallie serves on the Food and Nutrition Board of the National Academy of Science. Dr. Richard A. Rifkind has been appointed director of the Cancer Research Center of the Medical Center. Drs. Bigger, David J. Gocke, E. Carwile Le Roy were elected to the American Society for Clinical Investigation. Dr. Laragh served as visiting professor at the University of California in San Francisco and at Los Angeles. Dr. DeWitt S. Goodman was appointed a fellow of the John Simon Guggenheim Foundation and since September has been on a sabbatical leave as a visiting fellow at Cambridge (Clare Hall) and a visiting scientist at Strangeways. An exhibit on digoxin metabolism by Drs. John Lindenbaum and Vincent P. Butler, Jr. received an award from the American Medical Association.

Dr. Stanley E. Bradley served as visiting professor in the Department of Clinical Pharmacology at the University of Berne in Switzerland, and as the Searle Australia Visiting Professor to the Fourth Kanematsu Conference on the Kidney at the University of Sydney in Australia. He and Dr. Geraldine P. Bradley were honored in Mexico City on the occasion of the V International Congress of Nephrology. He continued to serve as president of the New York Heart Association and on the Board of Trustees of Mt. Desert Island Biological Laboratory.

Teaching and Patient Care

During 1972, 5,566 patients were cared for in the Medical Service of the Presbyterian Hospital with an average stay of 14.6 days. The observed disease patterns remained the same. A total of 16,300 new patients were seen in Admitting Emergency in the course of 46,385 visits to the clinic. The group and medical clinics accommodated 10,462 new patients.

The front door of Vanderbilt Clinic continues to pose a problem. We have added personnel which has improved the situation but major changes are contemplated to provide rapid screening and compassionate, more detailed primary care in an atmosphere conducive to good care and to graduate, undergraduate and paramedical teaching. It is hoped these plans can be initiated in July, 1973.

The group practice started on one of the teaching services and staffed by Drs. Michael H. Cohen, Peter E. Schrag and Jeffrey A. Stein has proven itself. The average length of stay and the cost of that stay were significantly shortened on this service. Although difficult to quantitate, communication with families was improved. Avoidance of the unwise

extension or intensification of care in the hopelessly ill individual was achieved in a significant number of patients.

The major clinical year clerkship in medicine is under intensive study by the curriculum committee of the department. The elective period in the last two years is being carefully scrutinized by the curriculum committee of the school. It is estimated that sixty-five per cent of the electives chosen are in the Department of Medicine.

The Medical Service of the Francis Delafield Hospital has continued to provide an excellent elective clerkship.

Dr. Joseph G. Sweeting with Drs. Robert T. Whitlock, Jeffrey A. Stein and George C. Hennig has made major improvements in the service function for gastroenterology.

The out-patient chest clinic at Harlem Hospital Center has been developed by Dr. John R. Edsall.

Backed by the New York Trudeau Society, Dr. Dudley F. Rochester planned and organized a course in pulmonary physiology given in October.

Research

In collaboration with Dr. Linda N. Cantor, Dr. Richard A. Rifkind has been studying the developmental biology of precursor cells for erythropoiesis in the fetal and adult organism. These cells may be cultured and respond to erythropoietin *in vitro*. With Dr. Marvin C. Cooper, he has examined the conditions *in vitro* for studying both white blood cell differentiation and red cell development from a common pluri-potent stem cell.

Dr. Arthur Bank continued studies on the molecular control of human hemoglobin synthesis. With Drs. Masaaki Terada, Salvatore Metafora, Lois W. Dow, Paul A. Marks and Elliott Grossbard (P&S '73), an efficient cell-free system derived from Krebs ascites tumor cells was used to translate isolated messenger ribonucleic acids (mRNAs) from human cells.

With Drs. Dan L. Kacian, Sol Spiegelman, Masaaki Terada, Salvatore Metafora, Lois W. Dow and Paul A. Marks, the biologically active human mRNA was used with the viral enzyme, reverse transcriptase to synthesize a DNA product with many characteristics of a complete globin gene.

During the past year, the Leukemia-Lymphoma group has continued its studies of a variety of chemotherapeutic regimens in the treatment of patients with acute leukemia, lymphomas and solid tumors. Many of these patients have been placed on protocols in controlled studies of Acute Leukemia Cooperative Group B.

With Dr. Beatrice Magdoff-Fairchild and Dr. Paul H. Swerdlow, Dr. John F. Bertles studied intermolecular organization of hemoglobin molecules in the intracellular filaments by x-ray diffraction. An attempt to characterize spatial relationships among Hb S molecules in filaments by computer-directed model building is in progress in collaboration with Professor Cyrus Levinthal (Biology).

Dr. Elliott F. Osserman with Dr. Mehdi Farhangi has documented that remission can be achieved in seventy-five per cent of myeloma patients treated with melphalan and cyclophosphamide. Dr. Takashi Isobe identified and characterized a previously unrecognized form of plasma cell dyscrasia associated with generalized lymphadenopathy and splenomegaly and the production of a monoclonal constant-half lambda light chain. Steve Collins (P&S '73) investigated a case of IgA plasma cell dyscrasia associated with hyperlipidemia and a defect in coagulation and demonstrated that the abnormal IgA specifically interfered with thromboplastin apparently by its lipid-binding properties. With Dr. L. G. Matthias Klockars, Messrs. James Halper and Robert Fischel (P&S '74), Dr. Osserman has established that lysozyme does, in fact, produce major structural changes in mammalian cell membranes presumably due to an enzymatic effect on membrane polysaccharides.

Drs. Jeanne A. Smith and Clayton L. Natta are participating in the Comprehensive Sickle Cell Center established at Harlem under an NIH grant.

Dr. John S. Kovach joined the faculty in July and will head the Clinical Cancer facility. He has been concerned with protocol studies of solid tumors.

Dr. I. Bernard Weinstein with Dr. Dezider Grunberger (Biochemistry) continues to study the effect of carcinogens on transfer RNA and with Dr. Koji Nakanishi (Chemistry) has elucidated the structure of an unusual fluorescent nucleoside. He is examining the mechanism of chemical carcinogenesis at the cellular level and using an assay system in which normal rat liver cells are grown in tissue culture and are transformed into tumor cells by *in vitro* exposure to liver carcinogens.

Dr. Hymie L. Nossel continues his work on the radioimmunoassay of fibrinopeptide A. Elevated levels of fibrinopeptide A have been found in the blood of a number of patients with suspected intravascular coagulation and these were reduced by heparin administration. With the use of a synthetic analog of fibrinopeptide B as immunogen a sensitive assay for fibrinopeptide B has been developed.

These studies have been made in collaboration with Drs. Robert E. Canfield, Vincent P. Butler, Jr. and Dr. George D. Wilner (Pathology). Visiting fellows Teresa L. Procupez, Ghulum D. Qureshi, and Ian Yudelma have participated in the studies. Dr. Harvey J. Weiss has continued his studies of platelet function. With Dr. Louise L. Phillips he has evaluated the factor in normal and hemophilic plasma which corrects the platelet defect in von Willebrand's disease. He has continued studies which have shown that the basic abnormality in some patients with defective platelet function is a deficiency of the electron-dense storage granules. Studies on patients with storage pool deficiency indicate that adenosine diphosphate, present in the storage granules, may be necessary for the platelet release reaction. Dr. Stuart W. Cosgriff with Dr. Frank E. Stinchfield (Orthopedics) has initiated a study of the thromboembolic complications of total hip replacement.

Dr. F. David Kitchin is inquiring into the genetic background of retinoblastoma, uveal melanoma, angiomas of retinae and neurofibromatosis.

Dr. Charles P. Felton is studying the epidemiology of sarcoidosis in the Harlem Community and is continuing control trials on patients with tuberculosis. Drs. S. R. Ryan, Veljko J. Krstulovic, C. Redington Barrett, Jr., A. L. Loomis Bell, Jr. are studying the pathogenesis of organizing interstitial pneumonia (fibrosing alveolitis) in dogs. With Dr. Jaime Martinez and Richard S. Irwin, Dr. Henry M. Thomas, III studied the compliance of the mediastinum of the dog. Dr. Hylan A. Bickerman with Drs. Edith B. Reilly and John M. Rodgers continued his studies on bronchoconstriction and the cough reflex. Dr. Dudley F. Rochester is studying diaphragmatic work and oxygen consumption. Dr. Peter R. B. Caldwell continues his collaboration with Dr. Ronald Nagel (Albert Einstein College of Medicine) and with Dr. Domingo Gomez (New York University Medical School) on the binding of 2,3-Diphosphoglycerate to hemoglobin. In addition, Dr. Robert J. Reza and Dr. Caldwell are collaborating with Dr. Richard Soffer (Albert Einstein College of Medicine) to isolate and purify angiotensin converting enzyme in the lung. With Dr. Vernon B. Baker and Dr. John R. Edsall, Dr. Julia M. Jones completed the active therapy portion of U.S. Public Health Study (19) of rifampin and with Dr. Michael Iseman and Dr. Gladys Hobby, she began studies on Quantitative Enumeration of tubercle bacilli in sputum of patients receiving chemotherapy.

Dr. Harry W. Fritts, Jr. and Dr. Henry M.

Thomas, III, working with Drs. Richard S. Irwin and Jaime Martinez, examined the effect of hypoxia on the pulmonary vessel in a canine model of granulomatous lung disease.

Dr. Gerard M. Turino in collaboration with Drs. Michael B. Pine, Maynard Beach, Mildred Scola and Thomas Cottrell has been studying the dynamics of pulmonary lymph flow in an experimental model of chemical pulmonary edema in dogs. In collaboration with Dr. Ines Mandl and Mr. Randolph Cole (Downstate '73), Dr. Turino has been studying the biochemical and physiological effects of pulmonary injury induced by overcoming serum inhibition of proteolysis by the administration of pancreatic elastase and bacterial collagenase.

Drs. Elsa-Grace V. Giardina and John T. Bigger, Jr. continued their studies of the mechanism of action of procaine amide and lidocaine in combatting ventricular arrhythmias. Drs. Bigger and Giardina, in collaboration with Drs. Dreyfuss and Schreiber (Squibb Institute of Medical Research) have found that hepatic metabolism is a significant factor in terminating the pharmacologic action of procaine amide. Drs. Bigger, Harold C. Strauss (Pharmacology), Allan L. Saroff and Giardina have developed methods which make possible new insights into human sinoatrial node function. Drs. Bigger, Robert H. Heissenbuttel, Giardina, Richard J. Stock, Charles Steiner, William P. Lovejoy, Daniel L. Macken, Ronald E. Drusin and James A. Reiffel have begun a program under the auspices of the Myocardial Infarction Research Branch, National Heart and Lung Institute, NIH, to evaluate the effectiveness of prophylactically administered antiarrhythmic drug therapy in controlling potentially serious cardiac arrhythmias in patients with proven coronary heart disease. In collaboration with Drs. Norman Kahn and Brian F. Hoffman (Pharmacology), the relation of plasma drug concentration to incidence of arrhythmias will be evaluated. Drs. Kung-Ming Jan and Shu Chien (Physiology) and Bigger studied the serial changes in blood rheology in acute myocardial infarction to determine the hemodynamic sequences accompanying the rheologic alteration.

Dr. Rejane M. Harvey with Drs. Yale Enson, Henry M. Thomas III, E. Carwile Le Roy, John A. Wood and Marvin Kushner (State University at Stony Brook) is investigating the pulmonary circulation of patients with progressive systemic sclerosis. With Drs. Enson and Wood she is evaluating the effect of variations in heart rate on the level of the pulmonary arterial diastolic pressure

in dogs with surgically induced chronic atrio-ventricular block.

Dr. M. Irene Ferrer and Dr. Marianne J. Legato are continuing the series of experiments manipulating pO_2 , pCO_2 and pH levels in perfusates to cardiac muscle.

Dr. Ferrer has completed a new computer program for the analysis of electrocardiograms which will be available in the near future. This was done in collaboration with Dr. Joseph Greenfield (Duke University), Dr. Lamar Crevasse (University of Florida) and Dr. Ray Bonner (IBM).

Dr. Robert B. Case and Dr. Pershotam P. Mathur with Dr. Frank Castellana (Engineering) continued their analysis of the relation of myocardial substrate uptake to coronary flow.

Dr. Paul J. Cannon, with Drs. Donald H. Schmidt, Melvin Weiss, Kent Ellis and William J. Casarella (Radiology) have formed a team at Presbyterian Hospital to study the myocardial circulation in patients with coronary atherosclerosis. Dr. Edward M. Dwyer with Dr. Cannon and Dr. Ralph B. Dell (Pediatrics) are continuing these studies at Roosevelt. These studies are performed at the time of diagnostic coronary arteriography and involve the measurement of regional myocardial blood flow with 133 xenon and a multiple-crystal scintillation camera. Dr. Schmidt has initiated with Drs. Edward J. Pollack and William Casarella (Radiology) a study of small vessel coronary artery disease and the collateral circulation.

Dr. John H. Laragh and his group have continued their studies of hormones and sodium and potassium metabolism and their role in the regulation of arterial blood pressure and of fluid balance in patients with high blood pressure or with congestive heart failure. Dr. Leslie P. Baer, Miss Jean E. Sealey and Drs. Hans R. Brunner, Fritz R. Buhler, E. Darracott Vaughan, Jr., Ginette B. Jacob and Julio E. Sotello continue as full time members of the group. Dr. Haralambos P. Gavras and Dr. Irene Gavras have joined the group on a full time basis after a two year training at the Hypertension Unit in Glasgow. On a part time basis, Drs. H. C. Stoerk, Jay I. Meltzer, Abbie I. Knowlton and Dr. Stephen Wotman of the Dental School have participated in the activities of the group. This professional group constitutes the "core" of the new Hypertension Center, and is funded by the National Heart and Lung Institute. This program gives broad support to basic research in hypertension and concurrently supports new treatment programs based on new information on

the causes of high blood pressure and the causes of major complications such as strokes and heart attacks. The Hypertension Center has been structured to include other groups and disciplines in the program. Among them are Drs. Paul J. Cannon and Donald H. Schmidt of this department, Sadek K. Hilal and William J. Casarella (Radiology), Dr. Stephen Wotman and his group (Dentistry), Dr. Harold F. Spalter (Ophthalmology), Dr. John C. M. Brust, Jr. (Neurology), Dr. Morton Levitt (Psychiatry) and Dr. Shu Chien (Physiology).

The Hypertension-Nephrology Group has analyzed over 200 patients with essential hypertension with an indication that this group is not homogeneous since they can be classified into various subgroups according to their renin and aldosterone secretion patterns. In the past year more reliable methods for the measurement of plasma renin and aldosterone levels have been developed and studies have defined further the role of renin and aldosterone in the production of vascular damage in animal models.

Dr. Abbie I. Knowlton, with Dr. Leslie P. Baer and Dr. John H. Laragh, has continued studies on a colony of spontaneously hypertensive rats.

The characteristics of hypertension in a heterogeneous black population are being studied at Harlem Hospital Center by Dr. Margaret M. Kilcoyne. Methods of hypertension detection are being assessed in the Harlem Community with a comparison between scatter-site screening and total one-site screening; the former is useful as a means of enhancing community awareness of health problems; the latter may ensure appropriate treatment and followup. Screening in the high school has been initiated with Dr. Peggy A. Alsup (Neurology).

Dr. Paul J. Cannon with Drs. David B. Case, Ralph B. Dell (Pediatrics), Mohamed Hassar and William J. Casarella (Radiology) has been studying the renal circulation in patients with different forms of hypertension. The group, together with Dr. E. Carwile Le Roy, is also performing a study on the hypertension and renal failure which occurs in patients with scleroderma. With Messrs. Robert Sciacca and Kenneth Liberman, a computer program has been developed which performs a non-linear analysis regression of kinetic data. Drs. Case and Stephen J. Gunther, together with Dr. Cannon, have studied the effects of ethacrynic acid upon transport and metabolism in isolated systems.

Drs. Stanley E. Bradley and Jaime B. Coelho have continued their studies of nephron function under various circumstances, such as hypothyroidism, the effect of increased intra-abdominal pres-

sure, and the effect of sodium chloride loading or depletion. Drs. Coelho and Bradley have found that spontaneously occurring hypertension in rats is characterized by an intrarenal redistribution that is characterized by a relative shift in perfusion to the superficial cortex. Dr. Kuang C. H. Chien is measuring changes in nephron dimensions produced in dogs by compensatory hypertrophy following unilateral nephrectomy in comparison with correlative measurements of functional capacity.

Dr. Thomas Q. Morris has carried forward his studies of biliary physiology in the dog. With Mrs. Katherine J. Baker, he is evaluating biliary plasma albumin and total protein excretion during various types of cholestasis, acute canine viral hepatitis and anticholestasis. He is collaborating with Drs. Hans Popper and Fenton Schaffner (Mt. Sinai School of Medicine) in a study of experimental cholestasis in rats.

During the past year Dr. David J. Gocke has continued studies of viral hepatitis in man with particular emphasis on the role of Australia antigen. Recent findings confirm his original demonstration of the infectivity of donor blood containing Australia antigen, but also indicate that posttransfusion hepatitis is not a single entity. Instead, it has been shown that the majority of posttransfusion hepatitis is *not* associated with Australia antigen, i.e. is not Type B hepatitis.

Dr. E. Carwile Le Roy and the Faulkner Arthritis Group have continued their studies of the pathogenesis of rheumatic and connective tissue disease with emphasis on the mechanisms of immune vascular damage and the causes of fibrosis and tissue destruction in patients with arthritis and related disorders. Drs. Jane H. Morse, Bonnie A. Bray, and Dorothy Estes continue as active investigators. Dr. John McWhorter has been named the first Ralph Boots Fellow in Arthritis in recognition of Dr. Boots, the founder of the Faulkner Clinic.

Skin fibroblasts from involved skin of patients with scleroderma have been grown in cell culture. With Dr. Julia M. Einbinder (Dermatology), Dr. Dorothy Estes has measured the direct cytotoxic effect of lymphocytes from patients with rheumatic diseases on normal and scleroderma skin fibroblasts in tissue culture. With Drs. John A. Downey (Rehabilitation Medicine) and McWhorter, studies of the peripheral circulation using plethysmography and isotope washout have been made on patients with scleroderma and with rheumatoid arthritis. With D. H. Maricq (Rutgers University) three distinct patterns of abnormal nailfold capillaries

have been observed in patients with 1) rheumatoid arthritis 2) sclerodermadermatomyositis and 3) systemic lupus erythematosus.

With Drs. Bonnie A. Bray and Konrad C. Hsu, three human basement membranes (placenta, lung, and renal glomerular) have been isolated and characterized by biochemical, immunochemical and immunofluorescent techniques. With Dr. Peter Hasselbacher, modifications of the Farr ammonium sulfate technique for detecting antibodies to DNA in serum have been made. With Dr. Joseph Korn, a self-teaching system of clinical, radiographic, and histologic material from rheumatic disease has been developed and is operational in the Arthritis-Immunology Elective Program.

Dr. Jane H. Morse has continued ultrastructural studies on the interaction of human complement component C1q and its interaction with immunoglobulins and also on a particle responsible for lymphocytosis and histamine sensitization obtained from B. Pertussis. In collaboration with Robert Mascitelli (P&S '73) experiments are underway to purify and characterize immunochemically the previously described alpha globulin responsible for immunosuppression of antibody synthesis and lymphocyte transformation.

Dr. Michael H. Grieco has conducted a double blind study of the effectiveness of cromolyn sodium in asthmatic subjects.

Dr. David J. McConnell continued his study of the plasma kallikrein inhibitors.

Dr. Vincent P. Butler, Jr. continued his studies with digoxin-specific antibodies. Drs. John Lindenbaum, Jacek J. Preibisz, Visiting Research Fellow of the World Health Organization, and Dr. Butler have further documented the problem of the variation in the bio-availability of digoxin from tablets prepared by different manufacturers. Drs. Robert Maulitz (P&S '72), Lindenbaum and Butler have demonstrated that neomycin impairs the gastrointestinal absorption of digoxin in man. Drs. Donald H. Schmidt, Stephanie P. April, U.S.P.H.S. Trainee in clinical immunology, Jerry D. Gardner (National Institute of Arthritis and Metabolic Diseases, Bethesda) and Butler have conducted studies of the mechanism by which specific antibodies reverse pharmacologic and toxic effects of digoxin. Drs. Schmidt, Jorge Lopez-Ovejero, New York Heart Association Fellow, and Butler have continued studies of the fate of hapten-antibody complexes in experimental animals.

Dr. Andrew G. Frantz, in collaboration with Drs. Gordon L. Noel and Han K. Suh, has found major elevations of prolactin, equalling or exceed-

ing those of growth hormone, in patients undergoing surgery and other forms of stress. Studies of normal sleep, carried out with Drs. Jon Sassin and Elliott Weitzman (Montefiore Hospital) have revealed a pronounced diurnal rhythm of prolactin secretion, with the highest secretory activity occurring during sleep. The previously identified ability of L-dopa to suppress prolactin secretion has been utilized by Dr. Frantz in association with Dr. David V. Habif (Surgery) and Dr. George A. Hyman in a clinical trial of L-dopa therapy in patients with metastatic breast cancer.

Together with Dr. Earl A. Zimmerman of the Department of Neurology and Dr. Alan Robinson (University of Pittsburgh), Dr. Frantz has continued to study the secretion of neurophysin and its anatomical localization in the hypothalamus and posterior pituitary. Dr. Kazim Husain, who has joined Dr. Frantz's laboratory, has developed a radioimmunoassay for vasopressin which is being applied to the measurement of this hormone in plasma and its correlation with neurophysin secretion.

Dr. Robert E. Canfield in collaboration with Dr. Francis J. Morgan, studied the glycoprotein hormone, human chorionic gonadotropin. Highly purified preparations of the alpha and beta subunits of this hormone were prepared and will be distributed as international standards by the National Pituitary Agency. In addition to a determination of the primary structure of the subunits, studies of the factors that influence the recombination of these molecules to form the native hormone have been completed.

Dr. Yoshikazu Kanda, working in collaboration with Drs. DeWitt S. Goodman, Francis J. Morgan and Robert E. Canfield, has determined most of the primary structure of human prealbumin, a thyroxine binding protein in plasma.

Dr. John N. Loeb has continued his studies on the effects of glucocorticoid hormones on growth. By employing weanling rats as a sensitive system for studying these effects, he has demonstrated a wide range in the sensitivity of DNA synthesis in a variety of non-lymphoid tissues to suppression by these compounds. Other studies have included the development of a simple and sensitive double-isotope technique which permits accurate comparison of different polyribosomes populations, and studies in collaboration with Drs. E. Reich and L. Ossowski at the Rockefeller University on the interaction of various serum factors with normal and virally transformed cells in culture.

With Dr. Joyce C. Shaver and Miss Elsie C.

Ewen, Dr. Nicholas P. Christy has continued studies of estrogen metabolism in cirrhosis of the liver. He has also continued his interest in the abnormal plasma adrenocorticotropin found in patients with pituitary-dependent Cushing's syndrome.

Dr. William Rosner has isolated sufficient human corticosteroid-binding globulin so that studies on its amino acid sequence (with Drs. Francis J. Morgan and Robert E. Canfield) and carbohydrate sequence (with Dr. D. Carlson, Western Reserve) can proceed. Human testosterone-estradiol-binding globulin has been isolated and its characterization is under active study.

Dr. Wylie Hembree has extended the tritium labeling technique to numerous compounds of biologic interest. These included human gonadotropins (LH and FSH), gonadotropin releasing hormone (GnRH), morphine, fatty acids and amino acids. David Taub, (P&S '73) has studied the plasma protein binding and metabolism of ^3H -ACTH. Radioimmunoassay and bioassay of ACTH have also been developed.

Dr. Joyce C. Shaver with Drs. LeClair Bissel, Susan M. Deakins, Nicholas P. Christy, S. Roy and research dietitian Mrs. Ruth Silverman is investigating endocrine function in rehabilitated and recovering chronic alcoholic subjects.

Dr. Sidney C. Werner with Dr. Joshua A. Fierer (Pathology) has continued a previous study of the Graves' disease thyroid in which immunopathology was found localized to the connective tissues and basement membranes of the gland and which included immunoglobulin E deposition. With Drs. H. A. Rubenstein and Vincent P. Butler, Jr., a satisfactory and simple radioimmunoassay was devised for triiodothyronine (T3). Dr. Werner and Dr. William Manger (New York University) have been studying thyroid gland function in spontaneously hypertensive rats.

Dr. Kenneth Sterling in collaboration with Dr. Victor F. Saldana, has observed the conversion of thyroxine (T4) to triiodothyronine (T3) by human liver and kidney cells *in vitro* at 37° C. In collaboration with Dr. Peter O. Milch and Dr. Saldana, Dr. Sterling has studied the cytosol binding proteins of rat kidney and liver tissues as well as those of human kidney cells cultivated *in vitro*. In collaboration with Dr. Milch, a satisfactory and practical radioimmunoassay has been developed for the determination of T3 concentration in human and animal sera.

Dr. Richard S. Rivlin demonstrated increased urinary excretion of glutamic acid and tyrosine in the hyperthyroid state and showed the inhibitory

effect of riboflavin deficiency on thyroid hormone action. The influence of thyroid hormone on riboflavin metabolizing enzymes in liver, brain and erythrocytes is being elucidated. A new method for determination of riboflavin concentration in human urine has been developed with Drs. Arpad G. Fazekas, and Carlos E. Menendez.

Dr. DeWitt S. Goodman and his colleagues in the Division of Metabolism have continued their studies of the vitamin A transport system in plasma, of human cholesterol metabolism, and of factors regulating insulin secretion in man. Studies of the plasma transport of vitamin A have been conducted by Drs. Frank R. Smith, J. E. Smith, Yoshikazu Kanda and Anantha K. Mallia, together with Dr. DeWitt S. Goodman. Progress continues on the study of the amino acid sequence of retinol-binding protein (RBP) and prealbumin, the two proteins involved in vitamin A transport; this study is being conducted by Dr. Kanda in collaboration with Drs. Robert E. Canfield and Francis J. Morgan. Considerable new information about the physicochemical properties of the vitamin A transport system has been obtained by fluorescence and circular dichroic studies, in collaboration with scientists in England and at the National Institutes of Health. Dr. F. Smith and Dr. Yasutoshi Muto completed a study of the comparative biochemistry of plasma vitamin A transport in a wide range of vertebrate species.

Clinical studies of human protein-calorie malnutrition have been conducted by Drs. Francis J. Smith and DeWitt S. Goodman in collaboration with investigators in Egypt, Central America and Thailand.

The program of the Center for Prevention of Premature Arteriosclerosis (CPPA) at the Medical Center has been developing actively during the past year. This program is part of a larger collaborative project involving three institutions, and directed by Dr. E. H. Ahrens, Jr. (Rockefeller University), Dr. H. A. Eder (Albert Einstein College of Medicine) and Dr. DeWitt S. Goodman. Clinical and metabolic studies dealing with various aspects of hyperlipidemia, arteriosclerosis, and/or coronary heart disease are being undertaken in this Center. The clinic of the Center at Columbia-Presbyterian is now fully operational in the Atchley Pavilion under the direction of Dr. Francis J. Smith and Dr. Goodman. A long-term study of cholesterol turnover in some of the patients with hyperlipidemia is in progress. A new three-compartment model of cholesterol turnover has been devised by Dr. Goodman and Dr. Robert P. Noble in collaboration with

Dr. Ralph B. Dell (Pediatrics). Drs. Paul J. Cannon, Hymie L. Nossel, and Roger L. Lerner are also participating in the program of the CPPA.

Dr. Roger L. Lerner has extended his studies of the factors which regulate insulin secretion in humans, using glucagon, tolbutamide and secretin. These studies involve normal control subjects, patients with diabetes, and patients with hyperlipidemia.

In association with Dr. David Quartermain (New York University), Dr. Theodore B. Van Itallie has studied hunger drive during starvation in rats whose depot fat has been enriched by diet with odd-carbon fatty acids, notably undecanoate.

Drs. Sami A. Hashim and P. Tantibhedhyangkul have studied the metabolic fate of intravenously administered ^{14}C -medium chain triglyceride and fatty acid (C8). Drs. C.K. Ho and Hashim have completed studies with streptozotocin-induced diabetes. Drs. Francis X. Pi-Sunyer and S. S. Sethi obtained evidence in lean and particularly obese men for stimulation of insulin secretion by the beta-hydroxybutyrate-induced hyperketonemia. Dr. Pi-Sunyer, in collaboration with Drs. R. G. Brodows and R. G. Campbell (University of Rochester), has studied metabolic and hormonal responses to deoxyglucose in patients with complete cervical cord transection. Dr. Robert S. Bernstein is continuing studies of the relationship of hexokinase isoenzymes to insulin sensitivity in rat adipose tissue, and the hormonal control of these enzymes, using an *in vitro* incubation system.

Dr. James A. Kennedy's studies on the enzyme systems involved in the conversion of dihydroorotic acid to orotic acid as well as the effect of feedback inhibition point to the key role of orotic acid in the regulation of the biosynthetic pathway of pyrimidines. Dr. Kennedy and Dr. Juan G. Edreira continue their investigation of the excretion patterns of orotic acid in subjects acutely intoxicated with ethanol.

Dr. Gerald B. Phillips characterized further two lipoproteins of human serum separated by agarose gel electrophoresis, the dense pre-beta lipoprotein which was discovered in his laboratory the year before, and the pre-alpha lipoprotein.

Dr. John Lindenbaum has continued studies of the effects of alcohol on the small intestine. With Dr. John F. Pezzimenti, vitamin B_{12} deficiency has been shown to impair the absorption of vitamin B_{12} itself in a study of 28 patients with untreated pernicious anemia. Also, with Dr. Pezzimenti, four patients with the unusual combination of red cell aplasia and megaloblastic anemia have been studied.

With Miss Nancy Whitehead (New York University), oral contraceptives have been demonstrated to cause megaloblastic changes in the cervical epithelium of twenty per cent of women taking oral contraceptives; these changes reverted to normal after folate therapy. With Drs. Hymie L. Nossel and Charles Onoura circulating inhibitors to factor V in a patient with massive hemorrhage have been shown to be IgG in nature.

Drs. S. Bennett Clark and Peter R. Holt in collaboration with physicians at the Albany Medical School have evaluated the intestinal absorption of fat during essential fatty acid deficiency (EFAD) in the rat. Dr. Clark, utilizing a new double isotope technique, has observed lipid turnover in the mucosal cell in various segments of the small intestine.

Drs. J.B. Weiss and Holt, pursuing studies of steady state perfusion of a mixed meal in man, have demonstrated the presence of a new, probably liquid crystalline phase during fat digestion intermediate between the oil droplet and the true micellar state. Major causes of steatorrhea have been analyzed by quantitating the individual compartments through which a lipid molecule passes during the digestion and absorption of fat.

Clinical studies by Dr. Norton S. Rosensweig of an "intestinal maladaptation syndrome" resulting from the failure of intestinal enzymes to adapt to dietary sugars and folic acid normally, have shown that this exists in some patients with celiac disease and tropical sprue and in a group of patients with functional bowel disease. Dr. J. Espinoza and Dr. Rosensweig have shown that the adaptive response of hepatic glycolytic enzyme activity to dietary sugars and folic acid normally, have shown that this exists in some patients with celiac disease and tropical sprue and in a group of patients with functional bowel disease. Dr. J. Espinoza and Dr. Rosensweig have shown that the adaptive response of hepatic glycolytic enzyme activity to dietary sugar decreases with age.

Dr. John S. Davis has continued to study esophageal manometry, particularly in the investigation of patients with hiatal hernia and reflux esophagitis.

Dr. Harold C. Neu and Elaine P. Winshell have continued investigations of the role of B-lactamases in the resistance of gram-negative organisms to penicillins and cephalosporins. They have studied new cephalosporin derivatives — cephacetrile, cephanone, and cefamycin in an attempt to discover structural modifications of B-lactam antibiotics which might increase antimicrobial activity. In collaboration with Dr. Charles E. Cherubin a high occurrence of R-factor (resistant) fecal bacteria

was found in children from low income populations contrasted with children from high income groups. The *in vitro* transfer of antibiotic resistance was demonstrated in a patient with Shigellosis and one with pyelonephritis. Dr. Jane Pitt demonstrated mechanisms of resistance to gentamicin which are not mediated by R-factors. During 1972 two full-time nurse epidemiologists were added to the Infectious Disease Division of Presbyterian Hospital. An active program of prevention of nosocomial infections is underway.

Acknowledgments

The department would find it difficult to continue functioning were it not for the generous contributions of many donors. Not all the names can be mentioned, but the department is grateful to all. Among the gifts received in tribute to those who have died, was a gratefully acknowledged gift in memory of Miss Joan Leslie Kramer from the staff of Assemblyman Stein's office, the funds to be used in Lupus Research. Also, additional gifts were received in tribute to one of the great donors to the work of the Medical Service and the Department of Medicine, Mr. Edwin L. Weisl, Jr. The list of donors during 1972 includes: Mrs. Harriet W. Ackley; Alicerey Weisl Foundation; the American Cancer Society, Inc.; the American Heart Association, Inc.; Annenberg Levee Charitable Trust; the Arthritis Foundation, Inc.; Avon Products Foundation, Inc.; Louis Bazzuro Estate; Beecham-Massengill Pharmaceuticals; Georgia W. Bellinger Estate; Henry and Shirlee Benach Foundation; Mrs. Susan M. Berson; the Bezalel Foundation; Bio-Science Laboratories; Bristol-Myers Products; Burroughs Wellcome Co.; Mr. Winslow Carlton; Mrs. Henry Cartan; Mr. Michael Chernow; Chichester duPont Foundation, Inc.; Ciba-Geigy Cor-

poration; The Continental Corporation Foundation; Cooley's Anemia Blood and Research Foundation, Inc.; Ciba-Geigy Corporation; The Continental Corporation Foundation; Cooley's Anemia Blood and Research Foundation for Children, Inc.; Mrs. Elizabeth K. Dollard; Dow Chemical Company; Eli Lilly and Company; the Estate of May L. Elling; Mrs. Charles W. Engelhard, Jr.; Fleitas Foundation; John Foglia Enterprises, Inc.; Mrs. Frederic N. Gilbert; Gulf & Western Foundation; the Stella and Charles Guttman Foundation, Inc.; Mr. and Mrs. Jack Himoff; Hoffman LaRoche Foundation; Mr. and Mrs. Herbert Irving; Mr. Ralph F. Leach; the G.J. Leness Foundation; Mr. Sidney B. Lifschultz; The Joe and Emily Lowe Foundation, Inc.; Mrs. Harry DuPont Lunger; Mr. P.R. Mallory; Josephine H. McIntosh Foundation, Inc.; Mrs. Paul M. Mazur; Menley & James Labs; The Merck Company Foundation; Munson Foundation; National Foundation; the New York Heart Association, Inc.; Ortho Research Foundation; Parke, Davis & Company; F&G Perlberg Foundation; The Population Council; Mr. and Mrs. H. Irving Pratt; Proctor and Gamble Company; Miss Mabel E. Quarrie; Fannie E. Rippel Foundation; Mrs. O'Neill Ryan; Sandoz Foundation; M.A. Schapiro Fund; Schering Foundation, Inc.; The William Lightfoot Schultz Foundation; Shearson Hammill & Company, Inc.; Dr. Norman F. Sprague, Jr.; Sterling-Winthrop Research Institute; Martha Washington Straus - Harry S. Straus Foundation, Inc.; Frank Strick Foundation; Mr. and Mrs. Benjamin Strong; Target Rock Foundation; Mr. Joseph A. Thomas; The Martha P. and Joseph A. Thomas Foundation; The Vanneck-Bailey Foundation; Joseph R. Warner; Warner Lambert Company; Mrs. Alexander M. White; James W. Winkelman, M.D.; Woodstock Foundation, Inc.

1972 Publications

Medicine

Arnheim, N.; Sobel, J. H. and Canfield, R. E.

Immunological resemblances between human leukemia lysozyme and hen egg lysozyme and their reduced carboxymethyl derivatives. *J. Molecular Biol.* 61:237-250, 1971.

Bank, A. and Marks, P. A.

Hemoglobin synthesis in thalassemia. *Series Haematologica* 4 (3):97-115, 1971.

Belanger, R.; Chandramohan, N., Misbin, R. and

Rivlin, R. S.

Tyrosine and glutamic acid in plasma and urine of patients with altered thyroid function. *Metabolism.* 21:855-865, 1972.

Bell, A. L. Loomis, Jr.

Management of patients with respiratory failure. Proceedings New York Society for Thoracic Surgery, November 19, 1971. *N. Y. State J. Med.* 72: 1959-1968, 1972.

Bennett Clark, S.

The uptake of oleic acid by rat small intestine: A comparison of methodologies. *J. Lipid Res.* 12:43-55, 1971.

Rate controlling steps in maximal steady state absorption and hepatic clearance of medium chain triglyceride. Chapter in "Present Concepts in Internal Medicine," publication of the Department of the Army, Letterman General Hospital, San Francisco, California, January 1972.

- Bomford, R. and Weinstein, I. B.
Transformation of a rat epithelial-like cell line by murine sarcoma virus. *J. Natl. Cancer Inst.* **49**:379-386, 1972.
- Bradford, D. S.; Foster, R. R. and Nossel, H. L.
Coagulation alterations, hypoxemia, and fat embolism in fracture patients. *J. Trauma* **10**:307-321, 1970.
- Brown, F. D.; Davidson, E. C., Jr. and Phillips, L. L.
Coagulation changes after hypertonic saline infusion for late abortions. *Obst. and Gynec.* **39**:538, 1972.
- Butler, V. J., Jr.
Assays of digitalis in the blood. *Progr. Cardiovasc. Dis.* **14**:571-600, 1972.
Practical aspects of immunological assays. *Med. Times* **100**:59-76, 1972.
- Campbell, R. G. and Hashim, S. A.
Odd chain fatty acid-enriched rat: Model for study of depot fatty-acid incorporation and turnover. *Proc. Soc. Exper. Biol. Med.* **141**:652-655, 1972.
- Canfield, R. E.; Kaye, G. I. and West, S.
The preparation and evaluation of tritiated poly-alanyl insulin derivatives. *Endocrinology* **90**:112-122, 1972.
- Cannon, P. J.; Dell, R. B. and Dwyer, E. M., Jr.
Measurement of regional myocardial perfusion in man with ¹³³xenon and a scintillation camera. *J. Clin. Invest.* **51**:964, 1972.
Regional myocardial perfusion rates in patients with coronary artery disease. *J. Clin. Invest.* **51**:978, 1972.
- Cantor, L. N.; Morris, A. J., Marks, P. A. and Rifkind, R. A.
Purification of the erythropoietin-responsive cell by immune hemolysis. *Proc. Natl. Acad. Sci. (U.S.A.)* **69**:1337, 1972.
- Cavallaro, J. B. and Rosensweig, N. S.
Chronic afferent loop syndrome with malabsorption, "sprue-like" mucosa and mid-loop stenosis. *Gastroent.* **60**:646, 1971.
- Cheng, C. J.; Fujimura, S., Grunberger, D. and Weinstein, I. B.
Interaction of 1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea (NSC 79037) with nucleic acids and proteins *in vivo* and *in vitro*. *Cancer Res.* **32**:22-27, 1972.
- Christy, N. P.
ACTH vs. CRF-like secretion by tumors. Letter to the Editor. *New England J. Med.* **287**:570, 1972.
Memorial: Philip Edward Smith, Ph.D. (1884-1970). *Endocrinology* **90**:1415, 1972.
Memorial: Yale Kneeland, Jr. *Trans Amer. and Climatol. Assoc.* **83**:xxxix, 1972.
- Chui, D. H. K.; Djaldetti, M.; Marks, P. A. and Rifkind, R. A.
Erythropoietin effects on fetal mouse erythroid cells: I. Cell population and hemoglobin synthesis. *J. Cell Biol.* **51**:585, 1971.
- Davidson, E. C., Jr. and Phillips, L. L.
Coagulation studies in the hypertensive toxemias of pregnancy. *Amer. J. Obst. and Gynec.* **113**:905, 1972.
- Dienstag, J. and Neu, H. C.
In vitro studies of tobramycin, an aminoglycoside antibiotic. *Antimicrob. Ag. and Chemother.* **1**:41, 1972.
- Dingle, J. T.; Fell, H. B. and Goodman, DeW. S.
The effect of retinol and of retinol-binding protein on embryonic skeletal tissue in organ culture. *J. Cell Sci.* **11**:393-402, 1972.
- Djaldetti, M.; Bessler, H. and Rifkind, R. A.
Hematopoiesis in the embryonic mouse spleen: An electron microscopic study. *Blood* **39**:826, 1972.
- Djaldetti, M.; Preisler, H., Marks, P. A. and Rifkind, R. A.
Erythropoietin effects on fetal mouse erythroid cells: II. Nucleic acid synthesis and the erythropoietin-sensitive cell. *J. Biol. Chem.* **247**:731, 1972.
- Dwyer, E. M., Jr.
Regional myocardial blood flow. Editorial, *Circulation* **45**:4, 1972.
- Eldridge, R.; O'Meara, K. and Kitchin, F. D.
Superior intelligence in sighted retinoblastoma patients and their families, *J. Medical Genetics* **9**:331, 1972.
- Fazekas, A. G.; Huang, Y. P.; Chaudhuri, R. and Rivlin, R. S.
Enhancement of biosynthesis of flavin coenzymes *in vivo* by thyroxine. Program of the Thyroid Association, Chicago, Illinois, September 20-23, 1972.
- Frantz, A. G.; Habif, D. V.; Hyman, G. A. and Suh, H. K.
Remission of metastatic breast cancer after reduction of circulating prolactin in patients treated with L-dopa. *Clin. Res.* **20**:864, 1972.
- Frantz, A. G.; Kleinberg, D. L. and Noel, G. L.
Studies on prolactin in man. *Recent Prog. Hormone Res.* **28**:527, 1972.
Studies on human prolactin. In: *Gonadotropins*. B. B. Saxena, C. G. Beling, and H. M. Gandy, eds., John Wiley & Sons, Inc., New York, 1972, p. 451.
Physiological and pathological secretion of human prolactin studied by *in vitro* bioassay. In: *Ciba Foundation Symposium on Lactogenic Hormones*. G. E. W. Wolstenholme and J. Knight, eds., Churchill Livingstone, Edinburgh and London, 1972, p. 137.
- Fujimura, S.; Grunberger, D.; Carvajal, G. and Weinstein, I. B.
Modifications of ribonucleic acid by chemical carcinogens. Modification of escherichia coli formylmethionine transfer ribonucleic acid with N-Acetoxy-2-Acetylaminofluorene. *Biochemistry* **11**:3629, 1972.
- Gerson, C. D.; Kent, T. H.; Saha, J. R.; Siddiqui, N. and Lindenbaum, J.
Recovery of small intestinal structure and function after residence in the tropics. II. Studies in Indians and Pakistanis resident in New York City. *Annals Int. Med.*, **75**:41-48, 1971.
- Gocke, D. J.
A prospective study of posttransfusion hepatitis: The role of Australia antigen. *JAMA* **219**:1165, 1972.
Australia antigen and immune complex disease. In: *Proceedings of the 2nd International Congress for*

- Virology Budapest 1971*. J. L. Melnick, ed., Houston Texas. S. Garger Publishers, New York, 1972, p. 190.
- Detection of hepatitis associated antigen: Electrophoretic assay procedures. In: *Hepatitis and Blood Transfusion*. G. N. Vyas, H. A. Perkins, and R. Schmid, eds., Grune & Stratton, New York, 1972, p. 115.
- Gocke, D. J. and Panick, J. M.
Transfusion of blood containing anti-au antibody. In: *Hepatitis and Blood Transfusion*. G. N. Vyas, H. A. Perkins, and R. Schmid, eds., Grune & Stratton, New York, 1972, p. 319.
- Goodman, DeW. S. and Leslie, R. B.
Fluorescence studies of human plasma retinol-binding protein and of the retinol-binding protein — Prealbumin complex. *Biochem. Biophys. Acta* **260**:670-678, 1972.
- Goodman, DeW. S. and Raz, A.
Extraction and recombination studies of the interaction of retinol with human plasma retinol-binding protein. *J. Lipid Res.* **13**:338-347, 1972.
- Gotto, A. M.; Lux, S. E. and Goodman, DeW. S.
Circular dichroic studies of human plasma retinol-binding protein and prealbumin. *Biochem. Biophys. Acta* **271**:429-435, 1972.
- Grunberger, D.; Weinstein, I. B.; Fink, L. M.; Nelson, J. H. and Cantor, C. R.
Interaction of N-2-acetylaminofluorene with RNA. "Research Symposium on Complexes of Biologically Active Substances with Nucleic Acids and their Modes of Action," Walter Reed Army Institute of Research, Washington, D. C. In: *Progress in Molecular and Subcellular Biology*, Vol. 2. F. Hahn, ed., Springer Verlag, Berlin-Heidelberg-New York.
- Himsworth, R. L.; Carmel, P. W. and Frantz, A. G.
The location of the chemoreceptor controlling growth hormone secretion during hypoglycemia in primates. *Endocrinology* **91**:217, 1972.
- Ho, C. K. and Hashim, S. A.
Pyridine nucleotide depletion in pancreatic islets associated with streptozotocin-induced diabetes. *Diabetes* **21**:789-793, 1972.
- Holmsen, H. and Weiss, H. J.
Further evidence for a deficient storage pool of adenine nucleotides on platelets from some patients with thrombocytopathia — "storage pool disease." *Blood* **39**:197, 1972.
- Holt, P. R.
Cholestyramine and polysorbate-80 in the treatment of choleheic enteropathy. *Am. J. Digest. Dis.* **15**: 781, 1970.
Medium chain triglycerides. *Disease-a-month*. June 1971.
The roles of bile acids during the process of normal fat and cholesterol absorption. *Archives of Int. Med.* **130**:574, 1972.
Fats and bile salts, I: Physiologic considerations. *J. Amer. Diet Assoc.* **60**:491, 1972.
Fats and bile salts, II: Pathological considerations. *J. Amer. Diet Assoc.* **60**:495, 1972.
- Isobe, T. and Osserman, E. F.
Pathologic conditions associated with plasma cell dyscrasias: A study of 806 cases. *Ann. N. Y. Acad. Sci.* **190**:507, 1971.
- Kacian, D.; Spiegelman, S.; Terada, M.; Metafora, S.; Dow, L. W.; Marks, P. A. and Bank, A.
In vitro synthesis of DNA for human globin genes. *Fed. Proc.* **31**:4280, 1972.
- Kacian, D.; Spiegelman, S.; Bank, A.; Terada, M.; Metafora, S.; Dow, L. W. and Marks, P. A.
In vitro synthesis of DNA components of human genes for globins. *Nature, New Biology* **235**:167-169, 1972.
- Kammerman, S. and Canfield, R. E.
The inhibition of binding of iodinated human chorionic gonadotropin to mouse ovary *in vivo*. *Endocrinology* **90**:384-389, 1972.
- Kammerman, S.; Canfield, R. E.; Kolena, J. and Channing, C. P.
The binding of iodinated hCG to porcine granulosa cells. *Endocrinology* **91**:65-73, 1972.
- Karparkin, S. and Weiss, H. J.
Deficiency of glutathione peroxidase associated with raised levels of reduced glutathione in Glanzmann's thrombasthenia. *N. Eng. J. Med.* **287**: November 23, 1972.
- Kilcoyne, M.; Gocke, D. J.; Daly, J.; Hsu, K. and Tannenbaum, M.
Association of nephrotic syndrome with drug addiction. *Lancet* **1**:17, 1972.
- Kitchin, F. D.; Bearn, A. G.; Alpers, M. and Gajdusek, D. C.
Genetic studies in relation to Kuru III. Distribution of the inherited serum group-specific protein (Gc) phenotypes in New Guineans: An association of Kuru and the Gc Ab phenotypes. *Amer. J. Hum. Gen.* **24**: Suppl., 1972.
- Lerner, R. L. and Porte, D., Jr.
Acute and steady-state insulin responses to glucose in nonobese diabetic subjects. *J. Clin. Invest.* **51**: 1624-1630, 1972.
Studies of secretin-stimulated insulin responses in man. *J. Clin. Invest.* **51**:2205-2210, 1972.
- Lindenbaum, J.; Mellow, M. H.; Blackstone, M. O. and Butler, V. P., Jr.
Variation in biologic availability of digoxin from four preparations. *New Engl. J. Med.* **285**:1344-1347, 1971.
- Lindenbaum, J.; Gerson, C. D. and Kent, T. H.
Recovery of small intestinal structure and function after residence in the tropics. I. Studies in Peace Corps volunteers. *Annals of Internal Medicine* **74**: 218-224, 1971.
- Lindenbaum, J. and Lieber, C. S.
Effects of ethanol on the blood, bone marrow, and small intestine of man. In: *Biological Aspects of Alcohol*. M. D. Roach, W. M. McIsaac, and P. J. Creaven, eds., Univ. of Texas Press, Austin, 1971, pp. 27-53.

- Lindenbaum, J.; Harmon, J. W. and Gerson, C. D.
Subclinical malabsorption in developing countries.
Amer. J. Clin. Nutr. **25**:1056-1061, 1972.
- Loeb, J. N.
The influence of temperature on the solubility of monosodium urate. *Arthritis Rheum.* **15**:189, 1972.
- Lufkin, E. G.; Stifel, F. B.; Herman, R. H.;
Rosensweig, N. S. and Hagler, L.
Effect of testosterone on jejunal pyruvate kinase activities in normal and hypogonadal males. *J. Clin. Endocrinol. & Metabol.* **34**:586, 1972.
- Mandel, W. J.; Bigger, J. T., Jr. and Butler, V. P., Jr.
The electrophysiological effects of low and high digoxin concentrations on isolated mammalian cardiac tissue: Reversal by digoxin-specific antibody. *J. Clin. Invest.* **51**:1378-1387, 1972.
- Marks, P. A.
Erythroid cell differentiation. Harvey Lecture. Series **66**:43, 1972.
Health systems research in the mainstream of academic medicine. *J. Clin. Invest.* **51** (6):1606-1610, 1972.
- Marks, P. A. and Rifkind, R. A.
Control of protein synthesis in erythropoiesis. *Science* **175**:955, 1972.
- Marubbio, A. T., Jr.
Antidiuretic hormone effect of pitressin during continuous pitressin infusion. *Gastroent.* **62**:1103, 1972.
- Metafora, S.; Terada, M.; Dow, L. W.; Marks, P. A. and Bank, A.
Increased efficiency of exogenous mRNA translation in a Krebs ascites cell-free system. *Proc. Nat'l. Acad. Sci.* **69**:1299-1303, 1972.
- Mezey, E. and Holt, P. R.
Ethanol inhibition of retinol oxidation catalyzed by human liver and cattle retinol alcohol dehydrogenase. *Exptl. Molecular Path.* **15**:148-156, 1971.
- Minio, F.; Howe, C.; Hsu, K. C. and Rifkind, R. A.
Antigen density on differentiating erythroid cells. *Nature* **237**:187, 1972.
- Morgan, F. J.; Kammerman, S. and Canfield, R. E.
Some studies on the structure and activity of human chorionic gonadotropin. In: *International Symposium on Gonadotropins*, New York, June 1971. B. B. Saxena, et al, eds., John Wiley & Sons, New York, 1972, p. 211-215.
- Morris, T. Q. and Gocke, D. J.
Modified acute canine hepatitis: A model of physiologic study. *Proc. Soc. Exp. Biol. Med.* **139**:32, 1972.
- Muto, Y. and Goodman, DeW. S.
Vitamin A transport in rat plasma: Isolation and characterization of retinol-binding protein. *J. Biol. Chem.* **247**:2533-254, 1972.
- Muto, Y.; Smith, J. E.; Milch, P. O. and Goodman, DeW. S.
Regulation of retinol-binding protein metabolism by vitamin A status in the rat. *J. Biol. Chem.* **247**:2542-2550, 1972.
- Nakanishi, K.; Blobstein, S.; Funamizu, M.; Furutachi, N.; Van Lear, G.; Grunberger, D.; Lanks, K. W. and Weinstein, I. B.
Structure of the "peroxy-Y Base" from liver tRNA^{Phe}. *Nature New Biol.*, Vol. **234**:107, 1971.
- Nelson, J. H.; Grunberger, D.; Cantor, C. R. and Weinstein, I. B.
Modification of ribonucleic acid by chemical carcinogens. IV. Circular dichroism and proton magnetic resonance studies of oligonucleotides modified with N-2-Acetylaminofluorene. *J. Mol. Biol.* **62**:331-346, 1971.
- Neu, H. C. and Winshell, E. B.
The relation of B-lactamase activity and cellular location to resistance of enterobacter to penicillins and cephalosporins. *Antimicrob. Ag. & Chemother.* **1**:107, 1972.
- Neu, H. C.
Opportunistic infections. *Medical Times* **100**:77, 1972.
- Neu, H. C. and Winshell, E. B.
In vitro evaluation of cephacetrile, a new cephalosporin antibiotic. *J. Antibiotics* **15**:400, 1972.
- Noel, G. L.; Suh, H. K.; Stone, J. G. and Frantz, A. G.
Human prolactin and growth hormone release during surgery and other conditions of stress. *J. Clin. Endocr.* **35**:840, 1972.
- Nossel, H. L.; Younger, L. R.; Wilner, G. D.; Procupez, T.; Canfield, R. E. and Butler, V. P., Jr.
Radioimmunoassay of human fibrinopeptide A. *Proc. Natl. Acad. Sci.* **68**:2350-2353, 1971.
- Nossel, H. L.; Wilner, G. D. and Drillings, M.
Inhibition of collagen-induced platelet aggregation by normal plasma. *J. Clin. Invest.* **50**:2168-2175, 1971.
- Nossel, H. L. and Deykin, D.
Circulating anticoagulants and blood fluidity. In: *Hematology, Principles and Practice*. C. E. Mengel, E. Frei, III, and R. Nachman, eds., Year Book Medical Publishers, Inc., Chicago, 1972.
- Nossel, H. L.
Activation of factors XII and XI in thrombogenesis. *Bull. N. Y. Acad. Med.* **48**:281-288, 1972.
The contact system. In: *Human Blood Coagulation, Haemostasis and Thrombosis*. R. Biggs, ed., Blackwell Scientific Publications, Oxford, 1972.
- Ohta, H. and Osserman, E. F.
Hydrolytic enzymes of human blood monocytes and neutrophils with special reference to lysozyme (muramidase). *Tohoku J. Exptl. Med.* **107**:229, 1972.
- Osserman, E. F. and Farhangi, M.
Plasma cell myeloma. In: *Hematology*. Williams et al, eds., McGraw-Hill Book Co., New York, 1972, p. 956-968.
- Osserman, E. F.; Takatsuki, K.; Farhangi, M.; Pick, A. I. and Isobe, T.
Plasma cell dyscrasias: general considerations; plasma cell myeloma; primary macroglobulinemia;

- amyloidosis; heavy chain diseases. In: *Hematology*. Williams *et al*, eds., McGraw-Hill Book Co., New York, 1972, p. 950-984.
- Pelter, A. and Estes, D.
Antinuclear antibodies. In: *Pathology Annual—1972*. Ioachim, ed., Appleton, Century, Croft, New York, 1972.
- Phillips, L. L.; Brown, F. D. and Davidson, E. C., Jr.
Coagulation changes resulting from hypertonic saline injection for late abortion. *Fed. Proc.* 31:268 Abs., 1972.
- Phillips, L. L. and Davidson, E. C., Jr.
Procoagulant properties of amniotic fluid. *Amer. J. Obst. & Gynec.* 113:911, 1972.
- Phillips, L. L. and Weiss, H. J.
Detection of fibrin monomer by two methods of protamine sulfate precipitation. Abst. of XIV Intern. Congress of Hematology 287, 1972.
Multiple coagulation defects in nine patients. Abst. of III Intern. Congress on Thrombosis and Haemostasis. Page 136, 1972.
- Pi-Sunyer, F. X. and Cushman, P., Jr.
Sheehan's syndrome and diabetes mellitus: observations on the Houssay phenomenon in man. *Amer. J. Med. Sci.* 264:143-147, 1972.
- Purcell, G., Jr. and Nossel, H. L.
Factor XI (PTA) deficiency. *Obst. & Gynec.* 35:69-74, 1970.
- Qureshi, G. D. and Nossel, H. L.
Stability studies of human fibrinopeptide A as measured by radioimmunoassay. *Proc. Soc. Exp. Biol. Med.* 140:1069-1072, 1972.
- Rayford, P. L.; Vaitukaitis, J. L.; Ross, G. T.; Morgan, F. J. and Canfield, R. E.
Use of specific antisera to characterize biological activity of hCG & Subunit preparations. *Endocrinology* 91:144-146, 1972.
- Redeker, A. J.; Carpio, N. M. and Gocke, D. J.
Increased anti-Hb antigen titers after administration of human protein solutions. *New Eng. J. Med.* 287:2, 1972.
- Rhodes, A. R.; Shea, N. and Lindenbaum, J.
Malabsorption in asymptomatic Liberian children. *Amer. J. Clin. Nutr.* 24:574-577, 1971.
- Rifkind, R. A.
The new medicine: Experiments in medical education. *Medical Times* 99:61, 1971.
- Rifkind, R. A.; Terada, M. and Marks, P. A.
Regulation of hemoglobin synthesis in the fetal mice. *Series Haematologica* 4:7, 1971.
- Rivlin, R. S.
Vitamin metabolism in hyperthyroidism. In: *The Thyroid*. S. C. Werner and S. H. Ingbar, eds., Harper and Row, New York, 1971, pp. 579-585, third edition.
Vitamin metabolism in hypothyroidism. In: *The Thyroid*. S. C. Werner and S. H. Ingbar, eds., Harper and Row, New York, 1971, pp. 750-754, third edition.
- Rochester, D. F. and Thomas, H. H., III
Evaluation of shunt-flow through non-ventilated gas-filled and gas-free alveoli in dogs. *J. Appl. Physiol.* 33:1-7, 1972.
- Rosensweig, N. S.; Herman, R. H. and Stifel, F. B.
The dietary regulation of small intestinal enzyme activity in man. *Am. J. Clin. Nutr.* 24:65, 1971.
- Rosensweig, N. S.
Adult lactase deficiency: genetic control or adaptive response? *Gastroent.* 60:464, 1971.
Dietary sugars and intestinal enzymes. *JADA* 60:483, 1972.
- Rosner, W.
Recent studies on the binding of cortisol in serum. *J. Steroid Biochem.* 3:531-542, 1972.
A simplified method for the quantitative determination of testosterone estradiol-binding globulin activity in human plasma. *J. Clin. Endocr.* 34:983-988, 1972.
- Rosner, W. and Hochberg, R.
Corticosteroid-binding globulin in the Rat: Isolation and studies of its influence on cortisol action *in vivo*. *Endocrinology* 91:626-632, 1972.
- Sachson, R.; Rosen, S. W.; Roth, J.; Cuatrecasas, P. and Frantz, A. G.
Prolactin stimulation by thyrotropin-releasing hormone in a patient with isolated thyrotropin deficiency. *New Engl. J. Med.* 287:972, 1972.
- Safrit, H. F.; Weiss, H. J. and Phillips, G. B.
The phospholipid and fatty acid composition of platelets in patients with primary defects of platelet function. *Lipids* 7:60, 1972.
- Saleh, J. W. and Hashim, S. A.
Sedimentation behavior of platelets in plasma from patients with hyperlipoproteinemia. *J. Clin. Invest.* 51:84a, 1972.
- Sassin, J.; Frantz, A. G.; Weitzman, E. D. and Kapen, S.
Human prolactin: 24-hour pattern with increased release during sleep. *Science* 177:1205, 1972.
- Sebrell, W. H., Jr.; King, K. W.; Webb, R. E.; Daza, C. H.; Franco, R. A.; Smith, S. C.; Severinghaus, E. L.; Pi-Sunyer, F. X.; Underwood, B. A.; Flores, M.; Conner, M. C.; Townsed, C. T.; Pezzotti, J. M. and Castillo, B.
Nutritional status of middle and low income groups in the Dominican Republic. *Archivos Latinoamericanos de Nutricion*, Vol. XXII:1-190, July, 1972.
- Smith, F. R.; Underwood, B. A.; Denning, C. A.; Varma, A. and Goodman, DeW. S.
Depressed plasma retinol-binding protein levels in systic fibrosis. *J. Lab. Clin. Med.* 80:423-433, 1972.
- Smith, J. A. and Reichman, L. B.
Lymphocyte transformation; an aid in the diagnosis of tuberculosis in patients with nonreactive skin tests. *American Review of Respiratory Diseases*, Vol. 106 194-201, 1972.
- Smith, J. E. and Borchers, R.
Environmental temperature and the utilization of β -carotene by the rat. *J. Nutr.* 102:1017-1024, 1972.

- Solomon, D. H.; Benotti, J.; DeGroot, L. J.; Greer, M. A.; Pileggi, V. J.; Pittman, J. A.; Robbins, J.; Selenkow, H. A.; Sterling, K. and Volpe, R.
A nomenclature for tests of thyroid hormones in serum: Report of a committee of the American Thyroid Association. *J. Clin. Endocr. Metab.* **34**: 884, 1972.
- Spelman, G. G. and Nossel, H. L.
Anticoagulant activity of dog hookworm. *Amer. J. Physiol.* **220**:922-927, 1971.
- Sterling, K.
Free thyroxine methods. In: *Methods in Investigative and Diagnostic Endocrinology*. Solomon A. Berson, General Editor, Vol. 1. *The Thyroid and Biogenic Amines*. J. E. Rall and I. J. Kopin, eds., North-Holland Publishing Co., Amsterdam-London, 1972, p. 209.
Triiodothyronine. In: *Methods in Investigative and Diagnostic Endocrinology* Solomon A. Berson, General Editor, Vol. 1, p. 216, North-Holland Publishing Co., Amsterdam-London, 1972.
- Sterling, K.; Brenner, M. A.; Newman, E. S.; Odell, W. D. and Bellabarba, D.
The significance of triiodothyronine (T3) in maintenance of euthyroid status after treatment of hyperthyroidism. *J. Clin. Endocr. Metab.* **33**:729, 1971.
- Stifel, F. B.; Herman, R. H. and Rosensweig, N. S.
Dietary regulation of glycolytic enzymes. XI. Effect of inhibitors of protein synthesis on the adaptation of certain jejunal glycolytic and folate-metabolizing enzymes to diet and sex steroids. *Biochim. Biophys. Acta* **237**:484, 1971.
- Terada, M.; Banks, J. and Marks, P. A.
RNA synthesized during yolk sac erythroid cell differentiation. *J. Mol. Biol.* **62**:347-360, 1971.
- Terada, M.; Metafora, S.; Dow, L. W.; Marks, P. A. and Bank, A.
Increased translation of specific mRNAs by addition of rabbit ribosomal salt wash to Krebs cell-free system. *Fed. Proc.* **31**:913a, 1972.
- Terada, M.; Metafora, S.; Bank, J.; Dow, L. W.; Bank, A. and Marks, P. A.
Conservation of globin mRNA in rabbit reticulocyte monoribosomes after sodium fluoride treatment. *Biochemical and Biophysical Research Communications* **47**:766, 1972.
- Tripodi, D.; Gocke, D. J.; McKee, A. P.; Hawk, J.; Campbell, J. and Pollack, W.
A comparative clinical evaluation of HAA detection among blood donors. *Transfusion* **12**:109, 1972.
- Turino, G. M.; Pine, M. B.; Shubrooks, S. J. and Carey, J. P.
The volume of extravascular water of the lung in normal man and in disease. *Bull. De. Physio-Path. Resp.* **7**:1161-1179, 1971.
- Turino, G. M.
Hypoventilation syndromes. In: *Bronchopulmonary Diseases*. Cranston Holman and Carl Muschenheim, eds., Harper and Row, 1972, p. 681-693.
- Turino, G. M. and Lourenco, R. V.
The connective tissue basis of pulmonary mechanics. In: *Pulmonary Emphysema and Proteolysis*. Charles Mittman, ed., Academic Press, 1972, p. 509-524.
- Volpert, E. M. and Werner, S. C.
Serum triiodothyronine concentrations in the iodine-deficient rat. *Am. J. Anat.* **135**:187, 1972.
- Ward, D. C.; Humphries, K. C. and Weinstein, I. B.
Synthetic RNA-dependent DNA polymerase activity in normal rat liver and in rat hepatomas. *Nature* **237**:499-503, 1972.
- Watson, J. F. and Butler, V. P., Jr.
Biologic activity of digoxin-specific antisera. *J. Clin. Invest.* **51**:638-648, 1972.
- Weinstein, I. B. and Fink, L. M.
Methods for studying mammalian transfer RNAs. In: *Methods in Cancer Research*. Vol. 6, Chapter VII, pp. 311-343, H. Busch, ed., Academic Press, Inc., New York, New York.
- Weinstein, I. B. and Hirschberg, E.
Mode of action of Miracil D. Research Symposium on Complexes of Biologically Active Substances with Nucleic Acids and their Mode of Action. Walter Reed Army Institute of Research, Washington, D. C. In: *Progress in Molecular and Subcellular Biology*. Vol. 2. F. Hahn, ed., Springer Verlag, Berlin-Heidelberg-New York.
- Weinstein, I. B. and Grunberger, D.
RNA as the target of reactive forms of chemical carcinogens. Proceedings of the Xth International Cancer Congress, Houston, Texas. In: *Oncology*. Vol. 1, pp. 47-57, Year Book Medical Publishers, Inc., Chicago, Illinois.
- Weiss, H. J. and Rogers, J.
Thrombocytopathia due to abnormalities in the platelet release reaction—studies on six unrelated patients. *Blood* **39**:187, 1972.
- Weiss, H. J.
The pharmacology of platelet inhibition. In: *Progress in Hemostasis and Thrombosis*. T. H. Spaet, ed., Grune & Stratton, New York, 1972, 1:199.
Thrombocytopathia. In: *Clinics in Haematology*. J. R. O'Brien, ed., W. B. Saunders, London, 1972, 1:369.
- Weiss, H. J.; Phillips, L. L. and Rosner, W.
Separation of subunits of antihemophilic factor (AHF) by agarose gel chromatography. *Thromb. Diath. Haem.* **27**:212, 1972.
- Weiss, H. J.
Abnormalities in platelet function due to defects in the release reaction. *Ann. N. Y. Acad. Sci.* **201**:161, 1972.
Congenital qualitative platelet defects. In: *Hematology*. W. J. Williams, E. Beutler, A. J. Erslev and R. W. Rundles, eds., McGraw-Hill, New York, 1972, p. 1166.
Acquired qualitative platelet defects. In: *Hematology*. W. J. Williams, E. Beutler, A. J. Erslev and R. W. Rundles, eds., McGraw-Hill, New York, 1972, p. 1171.

Weiss, H. J.

von Willebrand's disease. In: *Hematology*. W. J. Williams, E. Beutler, A. J. Erslev and R. W. Rundles, eds., McGraw-Hill, New York, 1972, p. 1217.

Platelet adhesiveness. In: *Hematology*. W. J. Williams, E. Beutler, A. J. Erslev and R. W. Rundles, eds., McGraw-Hill, New York, 1972, p. 1414.

Platelet aggregation. In: *Hematology*. W. J. Williams, E. Beutler, A. J. Erslev and R. W. Rundles, eds., McGraw-Hill, New York, 1972, p. 1415.

Weiss, H. J. (Editor)

Symposium on platelets and their role in hemostasis, New York, 1971. *Ann. N. Y. Acad. Sci.* **201**:1972.

Weiss, H. J. and Rogers, J.

Correction of the platelet abnormality in von Willebrand's disease by cryoprecipitate. *Am. J. Med.* **53**:1972 (Dec.)

Werner, S. C.; Wegelius, O. and Hsu, K. C.

Immune responses in stroma and basement membranes of the Graves' disease thyroid (IgM, IgE, IgG and complement). *Trans. Assoc. Am. Phys.* **84**:139, 1971.

Werner, S. C.; Wegelius, O., Fierer, J. A. and Hsu, K. C.

Immunoglobulins (E, M, G) and complement in the connective tissues of the thyroid in Graves' disease. *New Engl. J. Med.* **287**:421, 1972.

Wilner, G. D.; Nossel, H. L. and Procupez, T. L.

Aggregation of platelets by collagen: Polar active sites of insoluble human collagen. *Amer. J. Physiol.* **220**:1074-1079, 1971

Microbiology

HARRY M. ROSE

Borne Professor and Chairman of the Department

Attending Microbiologist and Associate Attending Physician

The department suffered a tragic and irreparable loss through the untimely death of Dr. Sam M. Beiser on 7 September 1972. Dr. Beiser joined the department in 1952 and soon became recognized as one of its most effective teachers and investigators. He was widely known for his pioneering work in the field of nucleic acid immunology. At the time of his death he had been appointed Acting Chairman of the department.

New appointments to the department included: Drs. Iris L. Doerr and Lan Wei Lo, Research Associates; Dr. Eugenia T. Gamboa, Research Associate (Neurology); Dr. Israel Siegel, Research Associate (at Roosevelt Hospital); and Dr. Beatrice C. Seegal, Special Lecturer. Dr. Norbert Wassermann was appointed Research Associate. Miss Louise A. Goode was promoted to Associate.

Dr. Calderon Howe, Professor of Microbiology, resigned to become Professor and Head of the Department of Microbiology, Louisiana State University Medical Center, New Orleans. Miss Lucille T. Lee, Assistant in Microbiology, resigned to take a position in Dr. Howe's new department. Mr. Michael Myer, Assistant in Microbiology, transferred to a similar position in the Department of Medicine. Dr. David Senitzer, Research Associate, left to become Assistant Professor of Microbiology, Medical College of Ohio at Toledo.

Dr. Laurence R. McCarthy finished his course of postdoctoral training in clinical microbiology and was appointed Co-Director, Clinical Microbiology

Laboratory, Memorial Hospital and Sloan-Kettering Institute, New York. Drs. Timothy E. Kiehn and Kenneth R. Dunlap, Jr., were appointed Trainees in clinical microbiology. New postdoctoral fellows included Dr. Mitsuo Torii (April-July 1972); Dr. Adam Friedmann (Fogarty International Center Fellowship); and Dr. Miercio E. Alues Pereira (World Health Organization Fellowship).

Eight students registered for the new course in clinical microbiology that leads to the M.S. degree.

Twenty-two graduate students were in residence during the year, including ten new students who entered in September. Three students completed their studies and received the Ph.D. degree: Dr. Tova Francus; Dr. Dorothea S. Sawicki (now a postdoctoral student with Dr. Peter Gomas, Sloan-Kettering Institute for Cancer Research); and Dr. Mark A. Wainberg (now working under a postdoctoral fellowship from the New York Cancer Research Institute in the Department of Immunology, Hebrew University, Hadassah Medical School, Jerusalem).

In preparation for his impending retirement, Dr. Rose ended his contract with the Army Research and Development Command and closed his research laboratory in September. The final work dealt with basic differences between influenza A and B viruses, and showed that amantidine hydrochloride, which is a useful prophylactic drug for the prevention of influenza A, operates by preventing uncoating of the virus at the cell surface, whereas it has no

effect whatever on influenza B virus.

The immunochemical laboratories under Dr. Elvin A. Kabat are operated jointly under the Departments of Microbiology, Neurology, and Human Genetics and Development. The research activities of the laboratory are concerned especially with the structure and biological activity of blood group A, B, H, Le^a, Le^b and I antigens, characterization of human antibodies, purification and study of the chemical and physicochemical properties of myeloma proteins and other animal and plant proteins (lectins) with receptor sites specific for blood group substances and other polysaccharides, and attempts to determine the three dimensional structure of the variable regions of immunoglobulin chains and to ascertain which residues make contact with the antigenic determinant and which are involved in three dimensional structure. The specificities of the blood group I and i antigenic determinants were studied by Dr. Ten Feizi, Rockefeller University, and Dr. Kabat. Human anti-I sera were classified into six and anti-i sera into four different groups depending on their capacities to react with I and i antigenic determinants on a precursor ovarian cyst from Nigeria, with human milk, with cow blood group substances, and with hydatid cyst blood group substances. Drs. Arne Lundblad and Sten Hammarström, International Postdoctoral Fellows of the United States Public Health Service and now at the University of Uppsala and the Wenner Gren Institute, respectively, together with Drs. Eduardo Licerio and Kabat isolated a number of oligosaccharides from the dialyzable portion of human ovarian cyst blood group B substance and elucidated their structures. Dr. Byron E. Anderson, now Assistant Professor of Biochemistry at Northwestern University Medical School, and Drs. Luciana Rovis and Kabat studied various conditions of alkaline borohydride degradation to determine how best to avoid the peeling reaction that takes place after alkaline cleavage of the oligosaccharide side chains from the peptide backbone of blood groups substances. Drs. Olle Larm, Bengt Lindberg, and Sigfrid Svensson, Department of Organic Chemistry, University of Stockholm, and Dr. Kabat collaborated on a study of the structure of the capsular polysaccharide of Type II pneumococcus and established the presence of isomaltobiuronic acid, which previously was inferred from immunochemical observations to occur in the polysaccharide. The doctoral dissertation of Dr. Valee Harisdangkul, a Rockefeller Fellow from Bangkok and a graduate student of Dr. Kabat, in collaboration with Drs. Robert J. McDonough and M.

Michael Sigel, University of Miami, described the isolation of a protein from normal shark serum which is specifically precipitated by levans and dextrans; it is not an IgM immunoglobulin but has a molecular weight of about 280,000 and is composed of four subunits. An additional portion of Dr. Harisdangkul's dissertation concerned the labelling of the isomaltose oligosaccharides with a nitrophenylflavazole at the reducing end and a study by fluorescence quenching of their interaction with fractions of purified human antidextran with combining sites of different sizes. Drs. Lundblad, Richard Steller and Kabat, in collaboration with Drs. Judith W. Hirst, Martin G. Weigert and Melvin Cohn, Salk Institute, studied two mouse myeloma proteins, one an IgA protein specific for dextran and the other, IgG3, specific for levan. Drs. Rovis and Kabat, and Michael Potter, National Cancer Institute, characterized a mouse IgA myeloma protein that reacts with *Salmonella weslaco*; it is specific for a terminal non-reducing β -linked N-acetyl-D-mannosamine residue. Dr. John Cisar, a postdoctoral fellow of the United States Public Health Service, studied several other mouse myeloma proteins specific for dextrans and levans. Miss Ingrid Outschoorn, a graduate student in microbiology, and Dr. Kabat studied the idiotypic determinants in human antidextran and antilevan produced in one individual over an extended period of time. Miss Florence Maisonrouge, a graduate student in the Department of Human Genetics and Development, studied the circular dichroism spectra of purified lectins from the snail *Helix pomatia* and from the seeds of *Dolichos biflorus* previously isolated in this laboratory. Mr. Walter Newman, a graduate student in chemical biology, studied horse blood group substances and fractionated type XIV antipneumococcal antibody on insoluble absorbents (for further details see report of Department of Human Genetics and Development). Dr. Pereira purified and characterized a variety of lectins with B and H specificity. Quantitative immunochemical determinations of gamma globulin in cerebrospinal fluid were carried out by Mrs. Sally R. Ogilvie. Drs. Kabat and Tai Te Wu, Northwestern University, collaborated on the study of the variable regions of immunoglobulin chains. The hypervariable regions which they identified in human kappa, human lambda and mouse kappa chains have now been established as existing in mouse lambda chains, and in the light chains of other species. Hypervariable regions have also been identified in human heavy chains. Using data on phi, psi angles in known proteins and on the as

assumption that the polypeptide backbone for the variable region of all human kappa light chains would be the same except in the hypervariable regions, a set of values for the phi, psi angles of residues 2-107 of the variable regions was selected; in the hypervariable portions values for a single Bence Jones protein were chosen. From these angles a model of the polypeptide backbone of the variable region was constructed. The disulfide bond between residues 23 and 88 formed and the hypervariable regions formed a contiguous site, about 35 Å long in good agreement with estimates of sizes of antibody combining sites from earlier immunochemical studies in this laboratory. A 6 Å X-ray resolution structure of the Fab fragment of a myeloma protein shows a variable region which is remarkably like that of the model. Dr. Kabat completed his term on the Molecular Biology Panel of the National Science Foundation but is continuing to serve on the Committee on Viral Hepatitis of the National Research Council. The joint French-British-American project to catch coelacanths off the Comores Islands was highly successful, two specimens having been caught; Dr. Kabat was chairman of the National Academy of Sciences Committee on Latimeria. Dr. Kabat delivered the First Ernest Witebsky Memorial Lecture on "General Features of Antibody Molecules" at the Third International Convocation on Immunology held in Buffalo in June, and also delivered the "Invitation Lecture" to the British Society for Immunology at their Annual Meeting in London on "Where is the Antibody Combining Site?" He also gave the opening lecture in a series "Current Concepts in Immunobiology" at the National Institutes of Health, participated in the course at La Jolla organized by the American Society of Immunologists and gave a lecture in the Physiology course at Woods Hole. Dr. Kabat served as a consultant to FAO and WHO and in this capacity visited the centers for research on East Coast Fever and Trypanosomiasis in Nairobi and the World Health Organization Research and Training Centers in Immunology in Nairobi, New Delhi, Bangkok and Singapore. He continues as an Associate Editor of the *Journal of Immunology* and as a member of the Scientific Committee of the New York Blood Center.

Dr. Bernard F. Erlanger, in collaboration with Mr. Wassermann and Mrs. Anne G. Cooper, continued work on photoregulation, preparing specific reagents for acetylcholinesterase and the acetylcholine receptor of the electric eel. The experiments with the electric eel were carried out with the

collaboration of Dr. David Nachmansohn, Department of Neurology. With the aid of these reagents, it was possible to compare, in stereochemical terms, the active sites of the receptor and of acetylcholinesterase. Collaboration with Dr. Beiser was continued on the immunochemistry and biochemistry of DNA-reactive antibodies. Dr. Senitzer completed studies on the development of a radioimmunoassay for purines and pyrimidines. Miss Rose M. D'Alisa, a student of Dr. Beiser's, attempted to prepare antibodies to a codon, and Mr. Robert C. Lauer, a student of Dr. Erlanger's, studied the effect of antithymidine antibodies on transformed cells. In collaboration with Dr. Orlando J. Miller, Department of Human Genetics and Development, the use of these antibodies for the identification and chemical mapping of chromosomes was studied. Dr. Erlanger gave seminars or participated in symposia during 1971-72 at the following places: St. John's University; Downstate Medical Center; Miles Laboratories in Indiana; University of Minnesota; Albert Einstein College of Medicine; Biophysical Society Meetings in Toronto; Smithsonian Institution in Washington, D. C.; University of Guelph, Canada; Vth Karolinska Symposium in Stockholm, Sweden; Institut Pasteur, University of Paris in Bicetre, and Institut Gustave Roussy, all in France; and at Pfizer Research Laboratories in Connecticut.

Dr. Stuart W. Tanenbaum was on leave of absence for the period 1 September 1971 to 31 August 1972, during which time he served as Program Director, Molecular Biology Section, National Science Foundation, Washington, D. C. In this interim, Dr. Francus continued work on the characterization of the pneumococcal neuraminidase isoenzyme system, and was awarded the Ph.D. degree at the completion of these studies. Several projects involving the molecular biology of cytochalasin D, a member of a homologous series of fungal metabolites which exhibit the most profound effects upon cultured mammalian cells were undertaken. Together with Miss Janet Tannenbaum, a graduate student, and Dr. Lo, procedures for isolating this compound and its congeneric substances from a strain of *Zygosporium mansonii* were substantially improved. Additional collaborative experiments with Drs. Gabriel C. Godman and Arlene D. Deitch, (Pathology), on cytological and molecular virological aspects of the effects of cytochalasin D on HeLa and Vero cells will be found in the report of the Department of Pathology. Together with Dr. Saul Puszkin (Neurology) and Dr. Elena Puszkin, Mt. Sinai Medical School, it was

shown that cytochalasin D is strongly and selectively bound to thrombosthenin, the contractile protein of platelets, and that it affects platelet aggregation, clot retraction, and release of biogenic amines. Dr. Doerrs studies were concerned with the synthesis of high molecular weight polymers containing isopentenyladenine and other minor base anticodon tRNA determinants, which will be investigated for use as possible antigens and as macromolecular complexants in *in vitro* protein synthesizing systems. Dr. Tanenbaum delivered seminars on various aspects of the foregoing research at the Worcester Foundation for Experimental Biology, Tufts University Medical School, New York University, Johns Hopkins University, The University of Miami, the National Institutes of Health, and the National Cancer Institute of the National Institutes of Health at Baltimore.

During the academic year, Dr. Herbert S. Rosenkranz was on leave as Visiting Professor in the Department of Virology of the Hebrew University-Hadassah Medical School, Israel. While there, in the laboratory of Dr. Yechiel Becker, Dr. Rosenkranz participated in two main research projects concerned with the biology of the trachoma agent, and the developmental cycle of herpes simplex virus. A procedure was developed for separating the secondary and elementary (infectious) bodies of the trachoma agent, and a method was found for arresting its development at the secondary body stage and then reversing the block to obtain a synchronized transition to the infectious forms. Using this technique the synthetic processes required for the transition from secondary to infectious bodies were determined. In addition, a new intermediary form between secondary and elementary bodies was discovered, and the time of trachoma DNA synthesis was determined. These findings help to elucidate the replicative cycle of the agent, and should aid the further development of treatment for clinical trachoma, which is especially important because a drug-resistant form of the disease is on the increase. The synthesis of structural proteins of herpes simplex virus in the presence of inhibitors of DNA synthesis was studied. Contrary to current belief, these proteins were produced in the *complete* absence of viral DNA synthesis. Dr. Rosenkranz also participated in studies on the ultrastructural properties of the viral DNA and the detection of an RNA polymerase in the herpes simplex virion.

Dr. Paul D. Ellner participated in teaching general microbiology, and the infectious diseases section of abnormal human biology. He also taught a

clinical microbiology elective, and infectious disease elective, for medical students, and two graduate courses. The Master's program in clinical microbiology was under his supervision. The postdoctoral training program in clinical microbiology was approved but not funded by the National Institute of Allergy and Infectious Diseases; but it was possible to obtain limited funds from outside sources. Drs. Kiehn and Dunlap were accepted into the program using funds provided by Metropolitan Pathology Laboratories, Inc. and The Upjohn Company. Dr. Paul A. Granato continued his second year of training. Research activities were concerned with the study of improved methods for the detection of bacteremia with particular attention to the role of cell wall-deficient forms, and rapid identification. Another project involved the development of new techniques for the recovery of strict anaerobic bacteria from clinical specimens. The Diagnostic Microbiology Service took over the responsibilities of the Surgical Bacteriology Laboratory in July; the markedly increased work load will be reflected in next year's report. A significant effort was made to develop new computer programs for the Diagnostic Microbiology Service. During the year the Diagnostic Service performed tests on 137,399 specimens, of which 96,030 were examined bacteriologically and 41,369 serologically.

Drs. Joe E. Coward and Councilman Morgan, in association with Dr. Donald H. Harter, studied the development of visna virus using ferritin-conjugated antibodies. Examination of infected sheep choroid plexus cells after indirect labeling revealed the presence of ferritin-conjugated antibody on extracellular particles which lacked a dense core and smaller particles containing osmiophilic cores. In addition, crescent-shaped forms emerging from the cell membrane were discretely labeled suggesting that the visna agent replicates by budding from the cell surface. Drs. Coward and Harter examined the mechanism of infection of visna virus and determined that the agent enters host cells by fusing with the cell membrane in a manner similar to that described with many animal viruses. Drs. Coward and David J. Gocke (Medicine), continued their studies of Australia antigen. Negative staining of fractions obtained by density gradient centrifugation of serum from patients with hepatitis reveals small virus-like particles. Serum fractions containing these particles were introduced into a variety of cell lines in attempts to recover the hepatitis agent. In association with Drs. Rosenkranz and Rose R. Feiner, studies were performed to determine the mode of action of hydroxyurea on

Staphylococcus epidermidis. Hydroxyurea is recognized as a specific inhibitor of DNA synthesis, but DNA synthesis was affected only secondarily, and although the drug caused a loss of colony-forming ability, it did not prevent cell division.

Dr. Konrad C. Hsu continued his immunopathologic studies on the spontaneously developed lupus-like nephritis in F1 hybrids of NZB/W mice. Localization of complexes of denatured DNA and mouse IgG in glomerular capillary walls was demonstrated by immunofluorescence and immunoperoxidase techniques in females about five months after birth and few of these animals survived beyond eight months. Morphologic and immunopathologic studies of human kidney, heart, lung and liver transplants, by light and electron microscopy, were continued in collaboration with Drs. Giuseppe A. Andres, State University of New York at Buffalo, Thomas E. Starzl, University of Colorado, and Kendrick A. Porter, St. Mary's Hospital Medical School, London. The results in 26 liver specimens from 20 orthotopic human liver allografts suggested that in the failure of these grafts, cell-mediated immunity and non-immunological factors were more important than humoral antibody. In association with Dr. Myron Tannenbaum (Pathology), 132 kidney specimens obtained by biopsy were examined by immunofluorescence and electron microscopy. Together with Drs. Bonnie A. Bray and E. Carwile Leroy (Medicine), basement membranes from human placental trophoblasts (TEM), pulmonary alveoli (ABM) and renal glomeruli (GBM) were isolated and analyzed. The antibody to TBM localized in TBM, ABM and GBM by direct immunofluorescence and immunoperoxidase bridge techniques. In collaboration with Drs. Anthony Girardi, Wistar Institute, Berge Hampar, National Cancer Institute, and Raymond V. Gilden, Flow Laboratories, intracellular localization of mammalian type C virus species-specific (gs-1) and inter-species-specific (gs-3) antigenic determinants were investigated using the indirect immunoperoxidase techniques and light microscopy. In association with Drs. Sidney C. Werner and Otto Wegelius (Medicine), 14 thyroid glands from patients with Graves' disease were studied by the immunofluorescence technique. Fluorescein-labeled antibodies to human

IgE, IgM, IgG, B1C and C1q were localized in focal areas of the stroma in all specimens as well as in the follicular basement membrane, suggesting that Graves' disease may be an immune disorder. In collaboration with Drs. Robert E. Bases, Albert Einstein Medical College, and Doreen S. Liebeskind, National Institute of Health Fellow in Radiology, the effect of radiation on tumor cells was studied using antibodies to specific bases of DNA. Preliminary results indicated that G-1 cells, which did not show immunoreactivity with antibodies specific for denatured or single-stranded DNA, became reactive after radiation.

Dr. Spyros M. Vratsanos participated in teaching microbiology to first-year dental students, lectured to second-year dental students in the program on oral biology, and taught a course in biochemistry to dental hygienists. Submaxillary saliva from patients with cystic fibrosis and from normal individuals was *examined* to determine the distribution of molecular weights, content of protein and carbohydrate, and significance of the protein-carbohydrate components in the organization of the molecules. Acid production as a metabolic effect of bacteria in the formation of dental plaque was studied, and work on the mechanisms of degradation and elimination of proteins in dental enamel was undertaken.

The department gratefully acknowledges support of its research activities from the American Cancer Society, the American Heart Association, the George A. Carden, Jr. Special Fund for Cancer Research, the Irene Heinz Given and John La Porte Given Foundation, the Philip Hanson Hiss, Jr. Memorial Fund, the Marion Laboratories, Inc., the Mary Murray Mahoney Memorial Fund, the Matheson Foundation, Metropolitan Pathology Laboratories, Inc., the National Institutes of Health, the National Science Foundation, the Office of Naval Research, the Damon Runyon Memorial Fund for Cancer Research, the Office of the Surgeon General, Department of the Army, the Joseph B. Stevens Memorial Fund, Harry M. Stevens, Inc., the United States Department of Agriculture, the Upjohn Company, and the Helen Hay Whitney Foundation.

1972 Publications

Microbiology

- Anderson, Byron; Rovis, Luciana and Kabat, Elvin A.
Immunochemical studies on blood groups. LIII. A study of various conditions of alkaline borohydride degradation on human and hog blood group substances and on known oligosaccharides. *Arch. Biochem. Biophys.* 148:304-314, 1972.
- Andres, Giuseppe A.; Accinni, Lidia; Ansell, I. D.; Calne, R. Y.; Halgrimson, C. G.; Herbertson, B. M.; Hsu, Konrad C.; Penn, I.; Porter, Kendrick, A.; Rendall, Jane M.; Starzl, Thomas E. and Williams, R.
Immunopathological studies of orthotopic human liver allografts. *Lancet* i:275-280, 1972.
- Breeze, Sidney S., Jr. and Hsu, Konrad C.
Techniques of ferritin-tagged antibodies. In: *Methods in Virology*. K. Maramorosch and H. Koprowski, eds., Academic Press, New York, 1971.
- Catalano, Louis W., Jr.; Harter, Donald H. and Hsu, Konrad C.
Common antigen in meningioma-derived cell cultures. *Science* 175:180-182, 1972.
- Dev, Vaithilingham G.; Warburton, Dorothy; Miller, Orlando, J.; Miller, Dorothy A.; Erlanger, Bernard F. and Beiser, Sam M.
Consistent pattern of binding of anti-adenosine antibodies to human metaphase chromosomes. *Exp. Cell Res.* 74:288-293, 1972.
- Feiner, Rose R. and Rosenkrantz, Herbert S.
A new effect of hydroxyurea: Inhibition of autolysis of *Staphylococcus epidermidis*. *Israel J. Med. Sci.* 8:562-564, 1972.
- Feiner, Rose R.; Rosenkrantz, Herbert S. and Coward Joe E.
An effect of hydroxyurea on *Staphylococcus epidermidis*: temporary loss of viability. *Antimicrob. Ag. Chemother.* 2:147-155, 1972.
- Feizi, Ten and Kabat, Elvin A.
Immunochemical studies on blood groups. LIV. Classification of anti-I and anti-i sera into groups based on reactivity patterns with various antigens related to the blood group A, B, H, Le^a, Le^b and precursor substances. *J. Exp. Med.* 135:1247-1248, 1972.
- Freeman, Mahlon V. R.; Beiser, Sam M.; Erlanger, Bernard F. and Miller, Orlando J.
Reaction of antinucleoside antibodies with human cells in vitro. *Exp. Cell Res.* 69:345-355, 1971.
- Harisdangkul, Valee and Kabat, Elvin A.
Studies on human antibodies. IX. Interaction of 1-(m-nitrophenyl)-flavozoles of isomaltose oligosaccharides with purified antidextran: quantitative hapten-inhibition and fluorescence quenching studies. *J. Immunol.* 108:1232-1243, 1972.
- Harisdangkul, Valee; Kabat, Elvin A.; McDonough, Robert J. and Sigel, M. Michael
A protein in normal nurse shark serum which reacts specifically with fructosans. I. Purification and immunochemical characterization. *J. Immunol.* 108:1244-1258, 1972.
- A protein in normal nurse shark serum which reacts specifically with fructosans. II. Physicochemical studies. *J. Immunol.* 108:1259-1270, 1972.
- Kabat, Elvin A.
Antigenic determinants and antibody complementarity. In: *New Concepts in Allergy and Clinical Immunology*. Proceedings of the VII International Congress of Allergology, Florence, 12-17 October, 1970. *Excerpta Medica International Congress Series* No. 232.
- Kabat, Elvin A. and Watkins, W. M.
Blood group antigens. I. The human blood group A, B, H, Le^a, Le^b, and I systems. In: *Progress in Immunology*, Academic Press, New York, 1971.
- Kabat, Elvin A. and Wu, Tai Te
Attempts to locate complementarity-determining residues in the variable positions of light and heavy chains. *Ann. New York Acad. Sci.* 190:382-393, 1971.
- Construction of a three-dimensional model of the polypeptide backbone of the variable region of kappa immunoglobulin light chains. *Proc. Nat. Acad. Sci.* 69:960-964, 1972.
- Kilcoyne, Margaret M.; Daly, John J.; Gocke, David J.; Thomson, Gerald E.; Meltzer, Jay I.; Hsu, Konrad C. and Tannenbaum Myron
Nephrotic syndrome in heroin addicts. *Lancet* i:17-20, 1972.
- Larm, Olle; Lindberg, Bengt; Svensson, Sigfrid and Kabat, Elvin A.
Structural studies on pneumococcus type II capsular polysaccharide. *Carbohydrate Res.* 22:391,397, 1972.
- Liebeskind, Doreen S.; Hsu, Konrad C.; Erlanger, Bernard F. and Beiser, Sam M.
Selective inhibition of transformed cells in tissue culture by antithymidine antibodies. *Nature* 234:127-128, 1971.
- Lundblad, Arne; Hammarström, Sten; Licerio, Eduardo and Kabat, Elvin A.
Immunochemical studies on blood groups. LII. Structures and activities of oligosaccharides produced by alkaline degradation of a blood group B substance previously subjected to partial hydrolysis by dilute hydrochloric acid. *Arch. Biochem. Biophys.* 148:291-303, 1972.
- Lundblad, Arne; Steller, Richard; Kabat, Elvin A.; Hirst, Judith W.; Weigert, Martin B. and Cohn, Melvin
Immunochemical studies on mouse myeloma proteins with specificity for dextran or for levan. *Immunochemistry* 9:535-544, 1972.
- Massafi, Kochavit; Carr, Howard S. and Rosenkrantz, Herbert S.
Hydroxyurea and cell death. *Israel J. Med. Sci.* 8:559-561, 1972.
- Rosenberg, Burton J.; Erlanger, Bernard F. and Beiser, Sam M.
Radioimmunochemical studies on nucleoside-specific antibodies using iodinated DNA. *J. Immunol.* 108:271-274, 1972.

- Rosenkranz, Herbert S.
Formaldehyde as a possible carcinogen. *Bull. Environm. Contam. Toxicol.* **8**:242-244, 1972.
- Rosenkranz, Herbert S. and Rosenkranz, Samuel
Reaction of DNA with phosphoric acid esters: Gasoline additives and insecticides. *Experientia* **28**:386-387, 1972.
- Rosenkranz, Herbert S. and Southwick, Fredrick S.
Preferential inhibition of DNA polymerase-deficient *E. coli* by chloroquine and quinacrine. *Environm. Mut. Soc. Newsletter* **5**:38, 1971.
- Rovis, Luciana; Kabat, Elvin A. and Potter, Michael
Immunochemical studies on a mouse myeloma protein having specific binding affinity for 2-acetamido-2-deoxy-D-mannose. *Carbohydrate Res.* **23**:223-227, 1972.
- Sinclair, Roger A.; Andres, Giuseppe A. and Hsu, Konrad C.
Immunofluorescent studies of the arterial lesions in rat cardiac allografts. *Arch. Path.* **94**:331-339-1972.
- Southwick, Frederick S.; Carr, Howard S.; Carden, George A., III; D'Alisa, Rose M. and Rosenkranz, Herbert S.
Effects of acridine orange on the growth of *Escherichia coli*. *J. Bact.* **110**:439-441, 1972.
- Taschdjian Claire L.; Toni, Evelyne F.; Hsu, Konrad C.; Seelig, Mildred S.; Cuesta, Manuel B. and Kozinn, Philip J.
Immunofluorescence studies of candida in human reticuloendothelial phagocytes: Implication for immunogenesis and pathogenesis of systemic candidiasis. *Am. J. Clin. Path.* **56**:50-58, 1971.
- Wasilaskas, Benedict L. and Ellner, Paul D.
Presumptive identification of bacteria from blood cultures in four hours. *J. Infect. Dis.* **124**:499-504, 1971.
- Werner, Sidney C.; Wegelius, Otto; Fierer, Joshua A. and Hsu, Konrad C.
Immunoglobulins (E, M, G) and complement in the connective tissues of the thyroid in Graves' disease. *New Eng. J. Med.* **287**:421-425, 1972.
- Zweig, Martin; Rosenkranz, Herbert S. and Morgan, Councilman
The development of coliphage T5: Ultrastructural and biochemical studies. *J. Virol.* **9**:526-543, 1972.

Neurological Surgery

J. LAWRENCE POOL

Professor and Chairman of the Department • Director of Service

On June 30, 1972 Dr. J. Lawrence Pool retired as Professor and Chairman of the Department and Director of the Service and Dr. Lester A. Mount consented to assume these positions on an interim basis. Dr. Thomas J. Bridges and Dr. Peter W. Carmel were promoted to Assistant Professor. Dr. Carmel has given up his responsibilities at Harlem Hospital. Dr. James E. O. Hughes who has an appointment at St. Luke's Hospital has also accepted an appointment at Roosevelt Hospital, filling the vacancy created by the resignation of Dr. Ervin E. Hanson who has moved to Greenwich, Connecticut. Dr. James E. Finn has been appointed Assistant in Neurological Surgery and is serving at Harlem Hospital and is doing research with Dr. Malcolm B. Carpenter (Anatomy).

The four senior residents who finished their neurosurgical training in July all have responsible positions, three are associated with universities: Dr. Marx G. Bowens with Harvard; Dr. Marshall L. Grode with U.C.L.A. and Dr. James E. Finn with Columbia. Dr. William F. Bingham is associated with the Gunderson Clinic in La Crosse, Wisconsin. The two graduates who took the American Board of Neurological Surgery examination passed. They are Dr. Howard M. Gardner and Dr. Ervin E. Hanson.

Dr. Lester A. Mount has been appointed to the Board of Directors of the American Association of Neurological Surgeons; this is the society which speaks for American neurosurgeons. He is also a

member of the Foreign Neurosurgical Training Committee of this society. He is Trustee and Vice President of the Foundation for International Education in Neurosurgery, a member of the Residency Review Committee for Neurosurgery, a member of the Nominating Committee of the Neurosurgical Society of America and a member of the Medical Board and Chief of Neurosurgery of Project Hope. He is doing clinical research with Dr. James E. Finn on suprasellar meningiomas and with Dr. Martin B. Camins on atypical teratomas and also continues the long term study of patients having new procedures for premature closure of suture of the cranial vault. He also continues his interest in intracranial aneurysms.

Dr. Edward B. Schlesinger continues his responsibilities on the Executive Committee of the Neurosurgical Society of America. The Brain Scan Laboratory, under Dr. Schlesinger's direction continued in its dual role as a diagnostic service of the hospital and as a research unit for the development of improved techniques in detection of central nervous system disorders using isotope techniques. New equipment has been added during the year to meet the constantly increasing demand for diagnostic services. During the year, the laboratory, along with Dr. Goldensohn's Electroencephalogram laboratory, has been chosen by the National Institute of Health as a center for intensive investigation of "cerebral survival". This involves complex studies of major importance in the field of transplant sur-

gery, and should yield insights helpful in the management of the patient with seriously traumatized or damaged brain.

The laboratory was also chosen to participate, under the National Institute of Health Support, in the research activities of the Clinical Cancer Centre of the Columbia-Presbyterian Medical Center. Much of the research involved has been under long-term investigation in this laboratory and the new funds will give welcome impetus to the work under way.

Studies of cerebrospinal fluid abnormalities and hydromyelia continues, and has proven useful both in comprehension of these major problems, and in the management of the clinical states involving these entities.

During the year Dr. Schlesinger read several papers at national symposia on cervical spine disorders and injuries, and on hydromyelia and the complications of surgical correction of spinal deformities. With Dr. W. Jost Michelsen, a paper describing a means of increasing the efficiency of scanning in the diagnosis of metastatic brain tumors was read at the annual meeting of the Neurosurgical Society of America. Dr. Schlesinger again participated in the annual New York area course in Nuclear Medicine for postgraduate students.

Dr. James W. Correll has continued the study of occlusive cerebral vascular disease. He has shown that strokes can also be caused by embolization from ulceration plaques in the absence of demonstrable arteriographic occlusion. He is continuing the investigation of the influence of the nervous system on blood coagulation and on lipid metabolism. For example he has found that electrical stimulation of implanted cerebral electrodes will produce changes in plasma triglycerides often within seconds. He has shared some of his findings at meetings of the American Association of Neurological Surgeons and the American Heart Association.

Dr. Edgar M. Housepian has continued work on brain tumor chemotherapy together with members of the Departments of Neurology, Radiology and Medicine. Drs. Schlesinger, Housepian and Michelsen of the Department of Neurological Surgery are participating in the Columbia University Cancer Research Center program in association with many other departments of the Medical Center. Approval of National Institutes of Health has been granted for the study of chemotherapy of tumors of the C.N.S. of brain scanning and isotope concentration and for the formation of a tissue bank for tumors of the C.N.S.

Dr. Housepian has been active in the development of an audio-visual center in the Neurological Insti-

tute which interconnects clinical and teaching areas. This included microsurgical viewing, closed circuit television and video taping. It is also intended to coordinate the teaching and training in all the fields closely related to neurosurgery including neurology, neuroradiology, nursing, rehabilitation, neuropathology as well as in the basic neurosciences. This will serve as a pilot project for the development of innovative techniques in teaching for use throughout the Medical Center. It has the active support of the Medical Center and the Medical School and is being accomplished with the help of Mr. William Unger of the Audio-Visual Services. Its funding has come from a generous contribution from the JHL Foundation and from private donors.

Dr. Housepian is continuing his interest in orbital tumors and presented a paper on the microsurgical anatomy of the orbital apex in Vienna. He serves as Chairman of the Peer Review Committee of the New York State Neurosurgical Society.

Dr. Thomas J. Bridges is continuing his interest in methods for relief of pain. He has developed a technique of transcutaneous application of variable intensity vibratory sensation to aid in the selection of patients for the application of more permanent dorsal column stimulation.

Dr. James G. McMurtry has continued to develop the technique of treating basilar aneurysms, with the aid of elective cardiac arrest. Three cases were done during the year and the material was presented to several meetings. He has continued his study of the use of Rheomacrodex as an aid to the treatment of aneurysms. The surgical treatment of trigeminal neuralgia patients has been further refined. With Dr. Richard D. Penn, work has progressed on the single cell recording from the trigeminal ganglion, in these patients.

Dr. Peter W. Carmel has continued investigation of hypothalamic areas that regulate neuroendocrine control. Studies with Dr. Richard Himsworth and Dr. Andrew L. Frantz (Medicine) on the mechanism for growth hormone release have been published.

In addition, the regulation of hypothalamic regulation of ovarian function are in progress with Drs. Ferin, Zimmerman and Vande Wiele of the International Institute for the Study of Human Reproduction. Regions controlling the negative-feedback effect of estradiol on stimulating LH have been reported. Studies on the syndrome of aseptic meningitis following posterior fossa surgery in children have been reported with Drs. Fraser and Stein (Tufts University). Additional studies on possible causative agents are in progress with Dr. Howard H. Kaufman.

Dr. W. Jost Michelsen continued his research efforts with Dr. Hilal perfecting the use of the magnetic catheter for treatment of intracranial vascular malformations. Investigations of various synthetic materials for plugging abnormal vessels were carried out. Intracranial intravascular EEG recordings were performed on baboons and in one human case. Dr. Richard D. Penn participated in these investigations.

Further work was carried out in Dr. Schlesinger's laboratory on isotope techniques and the problems of hydrosyringomyelia.

Drs. Robert W. Schick and James E. O. Hughes continue to teach interns and residents at St. Luke's Hospital and at Roosevelt Hospital. Dr. Schick is serving on the Peer Review Committee and the Advisory Committee on Malpractice of the New York County Medical Society.

Drs. Harvey R. Nova, George Becker, Henry D. Messer, James E. Finn, James E. O. Hughes and Richard Raynor participate in conferences and rounds at the Neurological Institute. Dr. Becker has been serving in various capacities in the Congress of Neurological Surgeons: Vice-President, Executive Committee, Editor of Congress Newsletter and Future Sites Committee. He has also been President of the New Jersey State Neurosurgical Society.

Drs. Messer, Raynor, Hughes and Finn teach residents, interns and medical students at Harlem Hospital.

The Department of Neurosurgery continues its active participation in teaching of residents on a 24 hour daily basis and in giving lectures and conferences on a daily basis. The department also gives lectures and conferences to medical students and nurses. Neurosurgery offers an elective to medical students from P&S and from other medical schools.

Since occupancy of beds in the Neurological Institute remains at almost full capacity the load of patient care and the number of operations performed yearly remains about the same.

Our residents continue to do excellent research as shown in the bibliography.

Acknowledgments

The department wishes to express its gratitude to the many grateful patients who have given money to the Medical School, the hospital and to the Neurosurgical service in support of many projects. The National Institute of Health has contributed in many ways: The Neurosurgical Training Grant; Neurosurgical Research Grant; Pod Research Cerebral Vascular Applications. The American Cancer Society, The JHL Foundation, The John Gunther Fund The International Institute for the Study of Human Reproduction and the estate of the late Alfred Jacobson have all made generous contributions to this department.

1972 Publications

Neurological Surgery

Becker, G. L.

How to get the most out of medical meetings. *Med. Soc. of N. J. Journal* 69:257-259, 1972.

Brisman, R.; McMurtry, J. G.; Renaudin, J. and Hogan, P.

Treatment of hydrocephalus. Shunts and choroid plexectomy. *N. Y. State J. Med.* 72:2045-2047, 1972.

Brisman, R. and Nova, H.

Carotid endarterectomy shunt-clamp. *J. Neurosurg.* 37:621, 1972.

Carmel, P. W.

Neurosurgery in pregnancy. In: *Surgery in Pregnancy*. H. R. A. Barber and E. A. Graver, eds. W. B. Saunders Co., Philadelphia, 1972.

Carmel, P. W.; Fraser, R. A. R. and Stein, B. M.

Aseptic meningitis following posterior fossa surgery in children. *JAMA.* 220:1554, 1972.

Carmel, P. W. and Markesbery, W. R.

Early descriptions of the Arnold-Chiari malformation: With a note on the contribution of John Cleland F. R. S. *J. Neurosurgery* 37:543-547, 1972.

Correll, J. W.

Non-stenotic lesions of the extra-cranial carotid causing stroke and the results of surgical treatment. Abstract — Circulation, Vol. XLVI, No. 4, October, 1972. *J. Amer. Heart Assoc.*

Driller, J.; Hilal, S. K.; Michelsen, W. J. and Penn, R. I. Cerebral arteriovenous malformations treated with magnetically guided emboli. Abstr. *ACEMB* 37: 1972.

Himsworth, R. A.; Carmel, P. W. and Frantz, A. J. Location of hypothalamic mediation of growth hormone release in response to hypoglycemia. *Endocrinology* 91:217-225, 1972.

Hollander, B. A.; Casarella, W. J.; Penn, R. D. and Hilal, S. K.

Intra-arterial embolization for the control of gastrointestinal bleeding. Abstr. Assoc. of University Radiologists, Albuquerque, New Mexico, May 1972.

Housepian, E. M.

Orbital tumors. Practice of Surgery. Chapter 12. In: *Neurosurgery*. V. Mark, ed. Harper & Row Publishers, Inc. Hagerstown, Maryland, 1972.

Mount, L. A.

Intracranial arterial aneurysms. Practice of Surgery. Chapter 1b. In: *Neurosurgery*. V. Mark, ed. Harper & Row Publishers, Inc. Hagerstown, Maryland, 1972.

Penn, R. D. and Hagins, W. A.

The kinetics of the photocurrent of retinal rod cells. *Biophys. J.* **12**:1073-1094, 1972.

Schlesinger, E. B.; McDowell, F. H. and Rowland, L. P.

Drugs for skeletal muscle disturbances. Chapter 19. In: *Drugs of Choice*. W. Modell, ed. The C. V. Mosby Co., St. Louis, 1972.

Neurology

RICHARD L. MASLAND

Moses Professor and Chairman of the Department • Director of Service

Teaching

Changes in Staff

Dr. Harry Grundfest became Professor Emeritus of Neurology, after 27 years of teaching and research in the department, having attained an international reputation for his studies of physiological processes in excitable tissues. He has trained many leaders in his field. Drs. Roger C. Duvoisin and Sid Gilman were promoted to Professor; Dr. Leon T. Kremzner to Associate Professor of Neurochemistry; Dr. John P. Reuben to Associate Professor of Neurophysiology; Dr. Terrone L. Rosenberry to Assistant Professor of Biochemistry; Dr. John C. M. Brust, Jr. to Assistant Clinical Professor (at Harlem Hospital) and Dr. Earl A. Zimmerman to Assistant Professor.

The Lucy B. Moses Prize in Clinical Neurology was awarded to Dr. Melvin D. Yahr for his report "Retrospect and Prospect in Neurology". Dr. Yahr was also elected to the Editorial Board of the *International Journal of Neurohumoral Transmission*. The Lucy B. Moses Prize in Basic Neurology was awarded to Dr. Donald H. Harter for studies of viral diseases of the nervous system.

Dr. Arnold P. Friedman continues as Director, American Board of Psychiatry and Neurology; Special Consultant, National Institutes of Health, NINDS; Chairman-Secretary of Research Group on Migraine and Headache of the World Federation of Neurology and Editor-in-Chief of yearbook, *Research and Clinical Studies in Headache: An International Review*. Dr. Earl A. Zimmerman was the

recipient of a Teacher-Investigator Award of the National Institute of Neurological Diseases and Stroke.

Dr. Sid Gilman was elected Fellow of the American Academy of Neurology and was appointed to the Editorial Board of the journal, *Neurology*.

Dr. Richard L. Masland served as chairman of the National Institute of Neurological Diseases and Stroke Committee on Brain Death and Irreversible Coma, and of the Committee on Epilepsy. He was appointed to the Commission on Developmental Disabilities of the State of New York. He is a member of the Research Programs Review Committee of the National Multiple Sclerosis Society, and Chairman of the Professional Advisory Committee of United Cerebral Palsy; of the Myasthenia Gravis Foundation; the Genetics Foundation and of the Epilepsy Foundation of America, New York Chapter.

Dr. Sidney Carter has been appointed a member of the National Institutes of Neurological Diseases and Stroke Council.

Dr. David Nachmansohn has become an Honorary Fellow of the Weizmann Institute in Rehovot, Israel, where he gave a lecture course to graduate students. He was one of the main lecturers at a symposium on membranes at the Max-Planck-Institut in Goettingen. He was a principal lecturer at a symposium on neurochemistry in San Vincente, Italy, and also lectured at the Max-Planck-Institut in Muenich and at the Institut Pasteur in Paris.

Dr. Eli S. Goldensohn, after serving as President

of the American Electroencephalographic Society, was elected member of the Council. He was a Visiting Professor at the Albert Einstein School of Medicine and at the New Jersey College of Medicine and Dentistry. Dr. Goldensohn was appointed Consulting Editor of *Epilepsia* and to the Editorial Board of *Neurology*. He directed the course on clinical electroencephalography at the annual meeting of the American Academy of Neurology. He was elected corresponding member in La Sociedad Peruana de Psiquiatria, Neurologia y Neuro-cirugia, and was guest lecturer at their IV International Congress.

Dr. Robert E. Lovelace was appointed Visiting Professor by the Universite Libre de Bruxelles for the academic year 1971-1972 during his six months sabbatical leave. During this time, he lectured at the University of Basel, Switzerland; the Charcot Clinic; Hospital de Salpetriere, Paris and the University of Glasgow.

The following members of the department recently resigned: Assistant Professors — Dr. Maurice Charlton to accept a position at the University of Rochester and Dr. James A. Lieberman to accept a position at the University of California, San Diego; Assistant Eva Bartels to continue her work at the University of Cali, Colombia, South America.

Major Changes in Curriculum

In addition to the regular five weeks neurology clerkship, the department now offers elective fourth year clerkships on ward, private, consultation, or out-patient services. In addition, special elective laboratory research programs are also available.

At St. Luke's Hospital, during the second year medical preceptorship, students receive two hours of lectures and four hours clinical training in neurology. An elective fourth year clinical preceptorship is also offered at St. Luke's and at Harlem Hospital.

The formal lecture program for residents has been continued and strengthened; weekly lectures now providing a complete review of clinical neurology and related fields.

The Parkinson's Research Center in collaboration with the program in neurobiology under Dr. Murray Glusman, Department of Psychiatry, has presented a series of weekly seminars in neurobiology. The center also sponsored the 3rd Annual James Parkinson Lecture given by Sir John Eccles on May 4, 1972.

The department provided training for 20 residents and fellows in Neurology; 7 fellows in pediatric neurology; 5 fellows in EEG; 1 in neuro-

ophthalmology under Dr. Myles Behrens; 4 fellows in neurophysiology under Drs. Grundfest and Reuben. The Parkinson Research Center provided research training for 7 medical students, 18 college students and 8 predoctoral fellows.

Research

Parkinson's and Allied Disorders

The Parkinson's Disease Clinical Research Center, under the direction of Dr. Melvin D. Yahr, has continued its comprehensive program of clinical and fundamental research to find the causes and treatment of diseases of the basal ganglia.

The clinical section under Drs. Roger C. Duvoisin, Myrna J. Schear, Marina Mendoza, Robert E. Barrett and Melvin D. Yahr has continued the evaluation of Levodopa and newer therapeutic agents. During the past year, the group has evaluated alpramethyldopa hydrazine, a peripheral dopa decarboxylase inhibitor, a new centrally active anticholinergic agent, Benapryzine; Amfonelic Acid, an amphetamine analogue and 3-O methyl-dopa.

With Drs. Robert T. Whitlock (Medicine) and Arthur B. Voorhees, Jr. (Surgery) studies of the use of Levodopa in hepatic encephalopathy have been carried out, and with Drs. David V. Habif (Surgery) and Andrew G. Frantz (Medicine) the effects of Levodopa in metastatic breast cancer have been assessed. With Dr. Ronald R. Fieve (Psychiatry) the occurrence of manic and/or depressive symptoms in parkinson patients receiving Levodopa has been studied.

Studies of metabolites of Levodopa in cerebrospinal fluid of parkinsonians have been undertaken, and of dopa, and 3-O methyl-dopa following the administration of these agents, and of the amino acid patterns of cerebrospinal fluid in various basal ganglia disorders.

Drs. Yahr and Cote have undertaken studies of brain tissue for monoamines in Huntington's Chorea in collaboration with Dr. Stanley Stellar of St. Barnabas Medical Center in Livingston, New Jersey. Dr. Gerald Cohen and Richard E. Heikkila have directed their studies toward the effect of 6-hydroxydopamine in brain. Cognitive and perceptual functions in parkinsonism are being studied by Dr. Florry Bowen. Dr. Bowen, Miss E. Brady and Dr. Yahr reported their findings of this study at the IV International Symposium on Parkinsonism. Dr. Abner Wolf has continued studying the brains of parkinson patients for alterations after treatment with Levodopa. He noted no adverse effects of the drug.

Dr. Sid Gilman with Drs. Paula Copack, Nachum

Dafny, Luis A. Marco, Mr. George Dauth and Mr. Alan Edelson, has continued to study the physiological mechanisms underlying muscle tone and motor control in experimental animals. Dr. Berl has continued his investigations of the actomyosin-like protein obtained from synaptosomal fractions of brain. Dr. Kremzner continued his studies with polyamines and their role in nerve cell growth and degradation. Dr. William Poillon has extended his studies to isolate and characterize brain tyrosine hydroxylase. Drs. Barrett and Catherine Mytilineou using histofluorescent microscopy are studying the properties of monoaminergic neurons and the effects of various pharmacological agents upon them. Dr. Virginia Tennyson is observing the development of catecholamine-containing areas such as the caudate nucleus, substantia nigra, and the sympathetic ganglia. Dr. Frederick A. Mettler's researches of the pathophysiology of abnormal movement in primates have confirmed his earlier studies on cats, indicating that striatal removal releases motor activity.

Epilepsy

Dr. Eli S. Goldensohn, Mr. Leonard Zablow, Dr. James Correll (Neurosurgery), and Mr. Alfred Salazar are studying the characteristics of normal and epileptiform activity in single cells in the cerebral cortex. They have succeeded in making intracellular recordings of up to 4 minutes duration from the cortex of man. Dr. Goldensohn and Mr. Zablow having completed animal studies, are now studying the distribution of electroencephalographic spikes in the cortex of man. Results were reported at the annual meeting of the American Electroencephalographic Society. In a national study on brain survival, Dr. Goldensohn and Dr. Edward B. Schlesinger (Neurosurgery), are studying the electroencephalogram and cerebral circulation as indicators of possible cerebral survival after unconsciousness and respiratory arrest. Dr. Sang Rhee, Dr. Morris Osborn now of Temple University, and Dr. Goldensohn are studying the electroencephalographic characteristics of deep and superficial intracerebral lesions. Dr. Goldensohn is studying with microelectrodes the physical changes in membrane during "spreading depression". Dr. Dennis Brown and Dr. Goldensohn reported on normal pressure hydrocephalus at the annual meeting of the American Electroencephalographic Society.

Under Dr. Charles E. Pippenger, the Edwin L. Weisl Sr. Laboratory for Clinical Pharmacology and the Anticonvulsant Drug Evaluation Laboratory was established July 1, 1971. Between October 1, 1971 and July 1, 1972 1,040 blood samples

(representing 3,120 individual drug determinations) have been assayed for diphenylhydantoin, phenobarbital and primidone utilizing gas liquid chromatography. Research is concentrating on rates of drug metabolism, malabsorption, renal excretion and drug interactions.

Dr. Masland is conducting studies of the clinical effectiveness of new anticonvulsant drugs. For this purpose and to provide special services for complicated seizure patients, the seizure clinic is being reactivated.

Diseases of Childhood

Drs. Abe Chutorian and John F. Nicholson (Pediatrics) have studied dietary management of paroxysmal encephalopathy due to reactive (post prandial) hypoglycemia. Dr. Chutorian with Dr. Donald H. Harter, is continuing his studies of three infants with multicystic leukoencephalopathy, attempting to demonstrate a viral etiology.

Dr. Richard Koenigsberger continued to study the myoneural junction in neonates, and with Drs. Surrendra Kaul and Mary Elizabeth Lell, to investigate vestibular function. Dr. Koenigsberger and Drs. Michael Painter and Surrendra Kaul are working with Dr. John M. Driscoll (Pediatrics) in a follow-up study of 107 infants with prematurity and asphyxia.

Dr. Edward J. Hart has continued to direct the "Readiness Nursery School", comprising 16 children under the New York City Board of Education. The school is to explore diagnostic and remediation methods for preschool children with hyperactivity and learning disabilities. Dr. Painter, with Dr. Nestor Truccone (Pediatric Cardiology), and Dr. William Gross (Radiology) completed an investigation of the alterations of cerebral blood flow and cardiac indices with changes in CO₂ tension in immature animals. The Xenon technique will be tried in immature animals preparatory to measuring cerebral blood flow in the human newborn. Dr. Patricia Crumrine working with Dr. Nicholson is investigating the enzymatic defect of children with Hurler's disease, and is testing fresh plasma infusion. She is refining the technique of transilluminating infants' skulls. Drs. Crumrine and David Rothner with Dr. Robert M. Ellsworth (Ophthalmology) are developing criteria to distinguish early retinoblastoma from tuberous sclerosis. An abnormal lipid has been isolated in the sera of patients with familial spastic paraplegia being studied by Dr. Rothner. With Dr. Chutorian and Dr. Hugo A. Keim (Orthopaedic Surgery) he has demonstrated occult neuromuscular diseases

among the underlying causes of scoliosis. Lateral cervical puncture has proven an improved method of obtaining cerebrospinal fluid in patients with low spinal cord pathology.

Dr. Laurence Carnay has continued his studies of the effect of anticonvulsant drugs on the neuromuscular junction of the frog sartorius. He finds that the membrane stabilizing effect of Dilantin is due to its ability to insert itself in the hydrophobic layer of the membrane, and prevent cooperative molecular transformation because of a steric hindrance effect. Dr. Martha B. Denckla and Dr. Rita G. Rudel are conducting studies of the performance deficits of dyslexic children. Dr. Denckla is obtaining normative data on items concerned with motor coordination from the conventional neurological examination. Dr. Rudel is working with a battery of psychometric tests of such functions as temporal and spatial orientation, and memory, right-left, motor proficiency, and language skills.

Headache

Dr. Arnold P. Friedman working with Dr. Ernest H. Wood (Neuroradiology) is investigating vascular changes in headache patients by the use of thermography. Dr. Friedman and Dr. A. James Rowan, Division of Neurology, Montefiore Hospital and Medical Center are studying the electroencephalographic features of migraine and tension headaches.

Multiple Sclerosis and Encephalitis

The neurovirology laboratory under the direction of Dr. Harter, is studying visna virus, an agent responsible for a slowly-evolving demyelinating disease of sheep. Visna virus contains nucleic acids and proteins similar to those found in RNA tumor viruses. Studies of visna virus-infected cells with the electron microscope using indirect ferritin antibody labeling have revealed that several structures found in visna-producing cells are immunologically related to visna virus. Under the sponsorship of a grant from the Multiple Sclerosis Society, Dr. Harter is investigating the brains of multiple sclerosis patients for enzyme activities or nucleic acid species similar to those found in visna and related viruses. Influenza virus infection of the mouse nervous system has been investigated. Histological changes occurring in brain were correlated with clinical symptoms, virus production and the distribution of viral antigen.

Neurobiology

With the retirement of Dr. Harry Grundfest, the research and training program in neurophysiology

is being carried forward with Dr. John P. Reuben, with emphasis on the biological and physiological characteristics of excitable membranes.

In the laboratory of Dr. Arthur Karlin, the receptor for acetylcholine has now been tagged in intact cells, membrane fragments, and detergent extracts. The labeled receptor has further purified by affinity chromatography. The close relationship between the affinity-labeled site and the cobra toxin binding site has been demonstrated.

The group directed by Dr. David Nachmansohn with Dr. Terrone L. Rosenberry continued their studies on the properties and functions of the proteins in excitable membranes, using the electroplax of electric fish. Drs. Rosenberry, Hai Won Chang and Yueh T. Chen can now extract from a single eel 30 mg or more of homogeneous acetylcholinesterase, making this important enzyme available to every investigator in the field in adequate amounts at reasonably low costs. Drs. Rosenberry and Chen and Mr. Ernest Bock have identified a number of apparent subunit species of homogeneous enzyme; and are testing the extent to which the subunits represent proteolytic cleavage of the native enzyme. Dr. Rosenberry, with Mrs. Eva Bartels, investigated the modifications of the excitability of the electroplax membrane by veratridine, a compound presumably acting on the Na channels.

Neuroendocrinology

In a new program Dr. Earl A. Zimmerman is using antisera to neurophysins to study posterior pituitary hormone function. With Dr. Andrew G. Frantz and Dr. Alan Robinson (University of Pittsburgh), he demonstrated neurophysins in the plasma and CSF of various animals including man by radioimmunoassay, and is studying the physiology of these neurosecretory proteins.

With Dr. Konrad C. Hsu (Microbiology), immunoperoxidase methods were developed for the localization of neurophysins in hypothalamic tissues. They are localized in supraoptic and paraventricular neurons. The neuroanatomical mapping and dynamics of neurosecretion of these proteins is being evaluated with Dr. Myron Tannenbaum (Urology and Pathology) and Dr. Peter W. Carmel (Neurosurgery).

Under the sponsorship of the International Institute for the Study of Human Reproduction, Dr. Zimmerman with Dr. Michel J. Ferin (Obstetrics and Gynecology) and Dr. Carmel are studying estradiol feedback sites in the hypothalamus of the monkey. They are also developing antisera to LRF (luteinizing hormone releasing factor) for use in radioimmunoassay and for tissue localization.

With Dr. Richard F. Defendini (Neuropathology) and Dr. Frantz, Dr. Zimmerman is conducting clinico-pathological study of acromegalic patients. They are comparing radioimmunoassay data on growth hormone and prolactin with routine pathology and immuno peroxidase data on pituitary tissue.

With Dr. Cote, and Dr. Menek Goldstein (New York University), the role of catecholamines and dopamine- β -hydroxylase in anterior pituitary secretion is being studied.

Muscle Disease

Dr. Joseph L. O'Brien and Dr. James Lieberman studied nerve conduction abnormalities in patients with myotonic dystrophy, which was reported at the 1972 annual meeting of the American Academy of Neurology. Dr. Stanley J. Myers, Dr. Robert E. Lovelace and Dr. S. V. S. Setty (University of Wisconsin) are studying in patients with upper motor neuron disorders the muscle histochemical effects of transneuronal degeneration, and in monkeys the effects of upper motor neuron lesions at the cortical level. Dr. Lieberman, Dr. Sang Rhee and Mr. Zablow, with Miss Sharon Grundfest, have studied the effects of Levodopa on H-reflexes and silent periods in patients with idiopathic Parkinsonism.

The special muscle histochemistry laboratory initiated by Dr. Lovelace was moved to the Department of Pathology, section of neuropathology. Dr. Lovelace with Dr. Carmel has been developing the techniques of motor end-plate biopsy, which he learned in the laboratories of Professor Coers in Brussels, and with the muscle histochemistry laboratory is introducing stains for disorders of end-plates.

Cerebro-Vascular Disease

The Harlem Regional Stroke Program, funded by the New York Metropolitan Regional Medical Program has continued to expand its community outreach and treatment resources utilizing specially trained community health workers. Dr. Ralph W. Richter serves as Project Director, Dr. Bertel Bruun as Stroke Unit Director and Dr. Peggy Alsop as Director of the Community Outreach Unit.

Drug Addiction

At Harlem Hospital, the neurology department Addiction Research Unit funded by the National Institute of Mental Health is studying the clinical,

pathologic, toxicological and epidemiological aspects of heroin addiction. The principal investigator is Dr. Richter, assisted by Dr. Yasoma Challenor, Dr. John C. M. Brust, Jr., Dr. Bertel Bruun, Dr. John Pearson and Mrs. Virginia Wells, R.N.

Patient Care

Over 15,000 patient visits were completed this year in the clinics of the neurology department. Specialized services are provided for muscle diseases, seizures, clinical drug research and parkinsonism. Consultation service is provided to any referring physician, a teaching service to the resident staff, and continuity of care to the neurological patient. The clinic facilities have been improved with the help of the Neurological Institute Auxiliary. The electroencephalographic laboratory under Dr. Goldensohn has increased to approximately 8,200 electroencephalographic examinations this year. The clinical electromyographic laboratory has increased to 2,491 tests of which 1,242 were electromyographic studies and 1,249 were nerve conduction studies.

Acknowledgments

The Department of Neurology gratefully acknowledges research support from the Muscular Dystrophy Association of America, Myasthenia Gravis Foundation, United Cerebral Palsy Research and Education Foundation, National Science Foundation, New York Heart Association, Hoffman-La Roche Foundation, United States Public Health Service (National Institute of Neurological Diseases and Stroke), William Black Endowment Fund, Parkinson's Disease Foundation, New York Metropolitan Regional Medical Program, National Institute of Mental Health, Mrs. Lucy G. Moses, Easter Seal Research Foundation, Ciba-Geigy Pharmaceuticals, Dreyfus Charitable Foundation, Hoyt Foundation, Walter Palmer Memorial Fund, Miles Hodson Vernon Foundation, John W. Hill Foundation, Bert C. and Ruth M. Goss Memorial Fund, Carolyn S. Spofford Foundation, Inc., Mrs. Marian K. Frelinghuysen, The Belle Fisher Chapter of the Big E, Mrs. Katherine Graham, Mr. and Mrs. John Indiveri, Mrs. Elizabeth G. Weymouth, Mr. David Hartfield, Jr., Beck Foundation, Robert Lehman Foundation, Inc., Merck and Co., Inc., and Beecham-Massengill Pharmaceuticals.

1972 Publications

Neurology

Barden, H.

The histochemical distribution and localization of copper, iron, neuromelanin and lysosomal enzyme activity in the brain of aging rhesus monkey and the dog. *J. Neuropathol. Exp. Neurol.* **30** (4):650-67, 1971.

Distribution of neuromelanin and catecholamines in the brainstem. *Lancet* **2**:923, Oct. 23, 1971.

Barden, H. and Martin, E.

Electron probe microanalysis of neuromelanin and lipofuscin. In: *Pigmentation: Its Genesis and Biologic Control*. V. Riley, ed., New York, Appleton-Century-Crofts, 1972.

Barrett, R. E.; Cote, L.; Tennyson, V. M. and Mytilineou, C.

The neostriatum of the fetal rabbit following injection of L-Dopa: A biochemical, histochemical, and electron microscopic study. *J. Neuropathol. Exp. Neurol.* **31**:166, 1972.

Barrett, R. E.; Fraser, R. A. R. and Stein, B. M.

A fluorescence histochemical survey of monoaminergic innervation of cerebral blood vessels in primate and humans. *Trans. Am. Neurol. Assoc.* **96**:39-45, 1971.

Bartels, E. and Rosenberg, P.

Correlation between electrical activity and phospholipid splitting by snake venom in the single electroplax. *J. Neurochem.* **19**:1251-1265, 1972.

Snake neurotoxins; effects of disulfide reduction on interaction with electroplax. *Science* **174**:1236-1237, 1971.

Berl, S. and Clarke, D. D.

Effects of Li⁺ on the metabolism in brain of glutamate, glutamine, aspartate and GABA from (1-¹⁴C)-acetate *in vitro*. *Brain Res.* **36**:203-213, 1972.

Bobrow, E.; Cote, L.; Lowe, Y.-H. and Fabry, T.

Dihydropterin quinonoid reductase activity in nervous tissues. *Trans. Am. Soc. Neurochem.* **3**, 1972.

Bowen, F. P., Hoehn, M. M. and Yahr, M. D.

Cerebral dominance in relation to tracking and tapping performance in patients with parkinsonism. *Neurology* **22** (1):32-39, 1972.

Bowen, F. P. and Mytilineou, C.

Histochemical changes in rabbit cerebral cortex after freeze lesions. *Neurology* **22**:446, 1972.

Bruun, B.; Baden, M. M.; Challenor, Y. B.; Pearson J. and Richter, R. W.

De Neurologiske Komplikationer ved heroinmisbrug. *Ugeskrift for Læger* **134**:89-93, 1972.

Burger, L. J.; Rowan, A. J. and Goldensohn, E. S.

Creutzfeldt-Jakob Disease: An Electroencephalographic Study. *Arch. Neurol.* **26**:428-433, 1972.

Carmel, P. W.; Ferin, M.; Zimmerman, E. A.;

Warren, M. P. and Vande Wiele, R. L.

Hypothalamic sites for estrogen control of LH secretion in monkeys. *Excerpta Medica International Congress Series No.* **256**:297, 1972.

Carter, S. and Gold, A. P.

Status epilepticus. In: *The Critically Ill Child*. C. A. Smith, ed., W. B. Saunders Co., Philadelphia, 1972.

Catalano, L. W., Jr.; Harter, D. H. and Hsu, K. C.

Immunofluorescence studies of cell cultures derived from human meningiomas. *Science* **175**:180-182, 1972.

Chutorian, A. M.

Benign paroxysmal vertigo in childhood. *Develop. Med. and Child Neurol.* **14**:513-515, 1972.

Cohen, G.; Heikkila, R.; Tennyson, V. M.; Cote, L.;

Barrett, R. E. and Mytilineou, C.

Biochemical, histochemical, and electron microscopic studies of the neostriatum in the fetal and adult rabbit. *Proc. Am. Soc. Cell Biol.* 11th Meeting. New Orleans, 1971.

Cohen, G.; Mytilineou, C. and Barrett, R. E.

6, 7-Dihydroxytetrahydroisoquinoline: Uptake and storage by peripheral sympathetic nerve of the rat. *Science* **175**:1269-1272, 1972.

Cohen, G.

Reactions of catecholamines with acetaldehyde to form tetrahydroisoquinolines. In: *Biologic Aspects of Alcoholism*, M. K. Roach, W. M. McIsaac and P. J. Creaven, eds., University of Texas Press, Houston, 1972.

Tetrahydroisoquinoline alkaloids in the adrenal medulla after perfusion with "blood concentrations" of (¹⁴C) acetaldehyde. *Biochem Pharmacol.* **20**:1757-1761, 1971.

Cote, L. J.; Cohen, G. and Yahr, M. D.

The metabolism of orally administered L-DOPA in Parkinson patients. *Trans. Am. Neurol. Assoc.* **96**:222-223, 1971.

Coward, J. E.; Harter, D. H.; Hsu, K. C. and Morgan, C.

Electron microscope study of development of vesicular stomatitis virus using ferritin-labeled antibodies. *J. Gen. Virol.* **13**:27-34, 1971.

Deamer, D. W.; Heikkila, R. E.; Panganamala, R. V.;

Cohen, G. and Cornwell, D. G.

The alloxan-dialuric acid cycle and the generation of hydrogen peroxide. *Physiol. Chem. Phys.* **3**:426-430, 1971.

Del Castillo, J.; Bartels, E. and Sobrino, J. A.

Microelectrophoretic application of cholinergic compounds, protein oxidizing agents and mercurials to the chemically excitable membrane of the electroplax. *Proc. Nat. Acad. Sci.* **69**:2081-2085, 1972.

Denckla, M. B.

Clinical syndromes in learning disabilities; the case for "splitting" vs. "lumping". *Journal of Learning Disabilities* **5**:401-406, 1972.

Color-naming defects in dyslexic boys. *Cortex* **VIII**:164-176, 1972.

Performance on color tasks in kindergarten children. *Cortex* **VIII**:177-190, 1972.

- Duffy, P. E.; Defendini, R. and Kremzner, L. T.
Regulation of meningioma cell growth, *in vitro* by polyamines. *J. Neuropathol. Exp. Neurol.* **30**(4): 698-713, 1971.
- Duvoisin, R. C. and Yahr, M. D.
Behavioral abnormalities occurring in parkinsonism during treatment with L-Dopa. In: *L-Dopa and Behavior*. S. Malitz, ed., New York, Raven Press, 1971.
- Duvoisin, R. C.
The evaluation of extrapyramidal disease. In: *Monoamines Noyaux Gris Centraux et Syndrome de Parkinson*. J. de Ajuriaguerra and G. Gauthier, eds., Paris, Masson, 1971.
- Duvoisin, R. C. and Yahr, M. D.
Parkinson's disease: A review of its drug therapy. *Drug Therapy* **1**:34, 1971.
- Duvoisin, R. C.
Summary of Treatment Session. In: *Monoamines Noyaux Gris Centraux et Syndrome de Parkinson*. J. de Ajuriaguerra and G. Gauthier, eds., Paris, Masson, 1971.
- Duvoisin, R. C.; Antunes, J.-L. and Yahr, M. D.
Response of patients with post-encephalitic parkinsonism to levodopa. *J. Neurol. Neurosurg. Psychiat* **35**:487-495, 1972.
- Eggers, A. E.
Autoradiographic and fluorescence antibody studies of the human host immune response to gliomas. *Neurology* **22**:246-250, 1972.
- Feldman, D. S.; Levere, R. D.; Lieberman, J. S.; Cardinal, R. W. and Watson, C. J.
Presynaptic neuromuscular inhibition by porphobilinogen and porphobilin. *Proc. Nat. Acad. Sci.* **68**:383-386, 1971.
- Friedman, A. P.
An overview of chronic recurring headache. *Wisc. Med. Jour.* **71**:110-116, 1972.
Headache in history, literature, and legend. *Bull. N. Y. Acad. Med.* **48**:661-681, 1972.
Reflections on the treatment of headache. *Headache* **2**:148-155, 1972.
Treating tension headaches. *Consultant* **12**:97-98, 1972.
Treatment of headache. *International J. of Neurol.* **9**:11-22, 1972.
Treatment of vascular headache. In: *International Encyclopedia of Pharmacology and Therapeutics*. A. Carpi, ed., Pergamon Press Ltd., London, 1972.
- Frigyesi, T. L. and Babin, A.
Basal ganglia-diencephalon synaptic relations in the cat. III. An intracellular study of ansa lenticularis, lenticular fasciculus and pallido-subthalamic projection activities. *Brain Res.* **35**:67-87, 1971.
- Frigyesi, T. L.; Ige, A.; Lulo, A. and Schwartz, R.
Denigration and sensorimotor disability induced by ventral tegmental injection of 6-hydroxydopamine in the cat. *Exp. Neurol.* **33**:78-87, 1971.
- Frigyesi, T. L. and Schwartz, R.
Electrophysiological analysis of the descending loop of corticothalamic projections. *Anat. Rec.* **172**:451, 1972.
Reciprocal innervation of ventrolateral and medial thalamic neurons by corticothalamic projections. *Fed. Proc.* **31**:377, 1972.
- Gilman, S.; Cote, L. J.; Marco, L. A.; Yahr, M. D. and Wolf, A.
Biochemical changes in neostriatum after 6-hydroxydopamine implantation in brainstem of monkey. *J. Neuropathol. Exp. Neurol.* **31**:167, 1972 (abstract).
- Gilman, S.; Marco, L. A. and Ebel, H. C.
Effects of medullary pyramidotomy in the monkey. II. Abnormalities of muscle spindle afferent responses. *Brain* **94**:515-530, 1971.
- Gilman, S. and Marco, L. A.
Effects of medullary pyramidotomy in the monkey. I. Clinical and electromyographic abnormalities. *Brain* **94**:495-514, 1971.
- Gilman, S.; Marco, L. A. and Lieberman, J. S.
Experimental hypertonia in the monkey. Interruption of pyramidal or pyramidal-extrapyramidal cortical projections. *Trans. Am. Neurol. Assoc.* **96**:162-168, 1971.
- Harter, D. H.; Schlom, J.; Burny, A. and Spiegelman, S.
Visna virus: A "slow" neurotropic agent with tumor virus properties. *Trans. Amer. Neurol. Assoc.* **96**:249-251, 1971.
- Harter, D. H.; Schlom, J. and Spiegelman, S.
Characterization of visna virus nucleic acid. *Biochem. Biophys. Acta.* **240**:435-441, 1971.
- Heikkila, R. E.
The generation of hydrogen peroxide by 6-hydroxydopamine: Potentiation by ascorbic acid. *Fed. Proc.* **31**:589, 1972.
- Heikkila, R. and Cohen, G.
Further studies on the generation of hydrogen peroxide by 6-hydroxydopamine. *Mol. Pharmacol.* **8**(2): 241-248, 1972.
- Heikkila, R. E.; Cohen, G. and Dembiec, D.
Tetrahydroisoquinoline alkaloids: Uptake by rat brain homogenates and inhibition of catecholamine uptake. *J. Pharmacol. Exp. Ther.* **179**(2):250-258, 1971.
- Herman, M. N.; Rowan, A. J. and Goldensohn, E. S.
Electroencephalographic changes occurring during L-DOPA treatment. *Amer. Neurol. Assoc.* **96**:252-254, 1971.
- Kilcoyne, M.; Alsup, P. and Richter, R. W.
Hypertension screening in the central Harlem community. (abstract) *Clin. Res.* **20**:249, 1972.
- Kremzner, L. T.
Metabolic fate of polyamines in the central nervous system. *Proc. Am. Soc. Neurochem.* **3**:96, 1972.
- Kremzner, L. T.; Hays, A. P.; Terrano, M. J. and Duffy, P. E.
Metabolism of putrescine in normal and neoplastic nervous system tissue. *Fed. Proc.* **31**:877, 1972.

- Kremzner, L. T. and Rosenberg, P.
Relationship of acetylcholinesterase activity to axonal conduction. *Biochem. Pharmacol.* **20**:2953-2958, 1971.
- Lieberman, J. S.; Copack, P. and Gilman, S.
Effects of focal freezing in ventrolateral nucleus and pulvinar on muscle spindle afferent responses. *Neurology* **22**:438, 1972.
- Lieberman, J. S. and O'Brien, J. L.
Impaired peripheral nerve conduction in myotonic dystrophy. *Neurology* **22**:453, 1972.
- Lovelace, R. E. and Myers, S. J.
Nerve Conduction and Synaptic Transmission. In: *The Physiological Basis of Rehabilitation Medicine*. J. A. Downey and D. C. Darling, eds., W. B. Saunders Co., Philadelphia, 1971.
- Marco, L. A.
Effects of amyltrimethylammonium on neuromuscular junctions of frog muscle. *Proc. Internat. Union Physiol. Sci.* **9**:368, 1971 (abstract)
Further findings on sarcomeric oscillations of frog skeletal muscle. *Life Sci.* **11**:509-515, 1972.
- Marco, L. A.; Copack, P. and Gilman, S.
Intrinsic links of caudate neurons. *Fed. Proc.* **31**:403, 1972.
- Marco, L. A.; Sommers, D. I.; Ebel, H. C. and Gilman, S.
Effect of cerebellar agenesis on muscle spindle afferent responses in cat. *Proc. Internat. Union Physiol. Sci.* **9**:368, 1971 (abstract).
- Mettler, F. A.
Choreoathetosis and striopallidonigral necrosis due to sodium azide. *Exper. Neurol.* **34**:291-308, 1972.
Neuropathological effects of sodium azide administration in primates. *Fed. Proc.* **31**:1504, 1972.
- Mettler, F. A. and Lieberman, M.
Professional liability — what's to be done. *Bull. N. Y. Acad. Med.*, 2nd series, **48**:779-790, 1972.
- Miyoshi, K.; Gamboa, E. T.; Harter, D. H.; Wolf, A. and Hsu, K. C.
Influenza virus encephalitis in squirrel monkeys receiving immunosuppressive therapy. *J. Immunol.* **106**:1119-1121, 1971.
- Mountcastle, W. E.; Harter, D. H. and Choppin, P. W.
The proteins of visna virus. *Virology* **47**:542-545, 1972.
- Myers, S. J. and Lovelace, R. E.
The Motor Unit in Muscle Action Potential. In: *The Physiological Basis of Rehabilitation Medicine* J. A. Downey and R. C. Darling, eds., W. B. Saunders Co., Philadelphia, 1971.
- Nachmansohn, D.
Similarity of chemical events in conducting and synaptic membranes during electrical activity. *Proc. Nat. Acad. Sci.* **68**:3170-3174, 1971.
- Painter, M.
Bilirubin neurotoxicity. *Dev. Med. and Child Neurol.* **14**:395-397, 1972.
- Parsa, M., Anderson, M. and Richter, R. W.
Central venous nutrition in severe tetanus. *Arch. Surg.* **105**:420-423, 1972.
- Patten, B. M.; Hart, A. and Lovelace, R. E.
Multiple sclerosis associated with defects in neuromuscular transmission. *J. Neurol., Neurosurg., and Psych.* **35**:385-394, 1972.
- Patten, B. M.; Mendell, J.; Bruun, B.; Curtin, W. and Carter, S.
Double blind study of the effects of dexamethasone on acute stroke. *Neurol.* **22**:377-383, 1972.
- Pearson, J.; Richter, R. W.; Baden, M. M.; Challenor, Y. B. and Bruun, B.
Transverse myelopathy as an illustration of the neurologic heroin addiction. *Hum. Path.* **3**:107-113, 1972.
- Potegal, M.; Copack, P.; deJong, J. M. B. V.; Krauthamer, G. and Gilman, S.
Vestibular input to the caudate nucleus. *Exp. Neurol.* **32**:448-465, 1971.
- Puszkin, S. and Berl, S.
Actomyosin-like protein from brain: Separation and characterization of the actin-like component. *Biochem. Biophys. Acta.* **256**:695-709, 1972.
- Puszkin, S.; Nicklas, W. J. and Berl, S.
Actomyosin-like protein in brain: Subcellular distribution. *J. Neurochem.* **19**:1319-1333, 1972.
- Redmond, G. P. and Cohen, G.
Sex difference in acetaldehyde exhalation following ethanol administration in C57BL mice. *Nature* **236**:117-119, 1972.
- Reiter, M. J.; Cowburn, D. A.; Prives, J. M. and Karlin, A.
Affinity labeling of the acetylcholine receptor in the electroplax: electrophoretic separation in sodium dodecyl sulfate. *Proc. Nat. Acad. Sci.* **69**:1168-1172, 1972.
- Richter, R. W. and Brust, J. C. M.
Pneumococcal meningitis at Harlem Hospital. *N. Y. State J. of Med.* **71**:2747-2754, 1971.
- Robinson, A. G.; Zimmerman, E. A.; Engleman, E. G. and Frantz, A. G.
Radioimmunoassay of bovine neurophysin: specificity of neurophysin I and neurophysin II. *Metabolism* **20**:1138-1147, 1971.
- Robinson, A. G.; Zimmerman, E. A. and Frantz, A. G.
Physiologic investigation of posterior binding proteins, neurophysin I and neurophysin II. *Metabolism* **20**:1148-1155, 1971.
- Rosenberg, P.; Kremzner, L. T.; McCreery, D. and Willette, R. E.
Inhibition of choline acetyltransferase activity in squid giant axon. *Biochem. Biophys. Acta* **268**:49-60, 1972.
- Rosenberry, T. L.; Chang, H. W. and Chen, Y. T.
Purification of acetylcholinesterase by affinity chromatography and determination of active site stoichiometry. *J. Biol. Chem.* **247**:1555-1565, 1972.

- Sax, D. S. and Mettler, F. A.
Mechanisms of azide ataxia: A result of a chemical cerebellar decortication. *Trans. Amer. Neurol. Assoc.* Vol. 96, 1971.
- Sokal, M.; Koenigsberger, M. R.; Rose, J. S.; Berdon, W. E. and Santulli, T. V.
Neonatal hypermagnesemia and the meconium-plug syndrome. *N. Eng. J. Med.* **286**:823-825, 1972.
- Tennyson, V. M.; Brzin, M. and Slotwimer, P.
The appearance of acetylcholinesterase in the myotome of the embryonic rabbit: An electron microscope-cytochemical and biochemical study. *J. Cell Biol.* **51**:703-721, 1971.
- Tennyson, V.; Heikkila, R.; Cohen, G.; Cote, L.; Barrett, R. and Mytilineou, C.
Studies on the neostriatum of late fetal, postnatal, and adult rabbits using biochemical, histochemical, and electron microscopic methods. *Anat. Rec.* **172**:416, 1972.
- Wolf, A. and Cowen, D.
Prenatal infection of the nervous system. In: *Pathology of the Nervous System*. vol. 3. J. Minckler, ed., New York, McGraw-Hill, 1972.
- Wood, E. H.; Friedman, A. P. and Hlmes, L. W.
Thermography in migraine. *Trans. Amer. Neurol. Assoc.* Vol. 96, 1971.
- Yahr, M. D.
L-dopa in neurological disease: Current status. *Res. Publ. Assoc. Res. Nerv. Ment. Dis.* **50**:494-511, 1972.
Results of long term administration of L-dopa. In: *Monamines Noyaux Gris Centraux et Syndrome de Parkinson*. J. de Ajuriaguerra and G. Gauthier, eds., Paris, Masson, 1971.
- Yahr, M. D. and Antunes, J. L.
Relapsing encephalomyelitis following the use of influenza vaccine. *Arch. Neurol.* **27**:182-183, 1972.
- Yahr, M. D. and Duvoisin, R.
Drug therapy of parkinsonism. *New Eng. J. Med.* **287**:20-23, 1972.
Pyridoxine and levodopa in the treatment of parkinsonism. *JAMA* **220**:861, 1972.
- Yahr, M. D.; Duvoisin, R.; Cote, L. and Cohen, G.
Pyridoxine, dopa and parkinsonism. *Adv. Biochem. Psychopharmacol.* **4**:185-184, 1972.
- Yahr, M. D.; Duvoisin, R. C.; Mendoza, M. R.; Shear, M. J. and Barrett, R. E.
Modification of L-dopa therapy of parkinsonism by alpha-methyldopa hydrozine (MK-486). *Trans. Am. Neurol. Assoc.* **96**:55-58, 1971.
- Yahr, M. D.; Wolf, A.; Antunes, J. L.; Miyoshi K. and Duffy, P.
Autopsy findings in parkinsonism following treatment with levodopa. *Neurol.* **22**:56-71, 1972.
- Yamaguchi, K.; Tomasi, L.; Cote, L. J.; Barrett, R. and Yahr, M. D.
Serotonin content of platelet enriched plasma in Parkinson patients prior to and during treatment with L-3, 4-dihydroxyphenylalanine (L-Dopa). *Biochem. Med.* **6**:210, 1972.
- Zeller, R. S. and Chutorian, A. M.
Vascular malformation of the pons in children. *Neurol.* **22**:420, 1972.
- Zimmerman, E. A.; Hsu, K. C.; Robinson, A. G.; Tannenbaum, M. and Frantz, A. G.
Distribution of intraneuronal neurophysin I in hypothalamic-posterior pituitary neurosecretory material revealed by immunoenzyme techniques. *Excerpta Medica Int. Congr. Series* **256**:111, 1972.
- Zimmerman, E. A.; Robinson, A. G.; Carmel, P. W.; Hsu, K. C.; Tannenbaum, M. and Frantz, A. G.
Hypothalamic and cerebrospinal fluid neurophysins. *Clin. Res.* **20**:446, 1972.

Nursing

MARY I. CRAWFORD

Professor and Chairman of the Department • Director of Service

New appointments to the faculty of the Department of Nursing are: Eunice Messler, Assistant Professor; Elizabeth Carter, Assistant Professor; Sandra Regenie, Assistant Professor; Patricia Blagman, Associate; Geraldine Lynch, Associate; Jeanne Murray, Associate; Mary Smith, Associate; Aurora Villafuerte, Associate; Lucy Warren, Associate; Patricia Beaulieu, Instructor; Pamela Dudac, Instructor; Carol Jean Foy, Instructor; Karin Freas, Instructor; Pauline Krajewski, Instructor; Melvina Lohman, Instructor; Jane Mendlesohn, Instructor; Bonita Schulze, Instructor; Carolyn Wrubel, Instructor; Freda Bush, Instructor at Harlem; Nancy Brown, Instructor at Harlem; Anne Stein, Instructor at Harlem; Doris Barker, Instructor at Presbyterian; Andrea Renovitch, Instructor at Presbyterian; Barbara Brennan, Instructor at Roosevelt; Barbara Petersen, Instructor at Roosevelt; Eldra Simmons, Instructor at Roosevelt; and Irene McEachen, Instructor at St. Lukes. Promotions include: Virginia Ehmann, to Assistant Professor; Linda Hamlin, to Assistant Professor; Mary P. Lind, to Assistant Professor; Nancy Sargis, to Assistant Professor; and Francesca Castronova, to Associate in Nursing. Appointments to the Administrative Staff of the Department of Nursing include: Susan Alexion, Administrative Assistant; Rosemary Ash, Director of Residence; Nancy Charles, Assistant Director of Residence; and Elin Ozdimer, Director of Admissions. Helen Pettit has been appointed as Assistant Dean (Nursing). Laura Munson and Agnes Shaw have been

appointed as Instructors in the School of Practical Nursing. Marjory Purinton, Administrative Assistant in charge of the Nurse's Registry retired in October 1972 and has been replaced by Elizabeth Auld. Violet Mastroberte has been appointed as Assistant Director of Nursing in Medicine. She has been serving in this position as Acting Assistant Director since January, 1971. The Nursing Department was deeply saddened by the death of Marguerite Jansen, Senior Supervisor in the Operating Rooms. New appointments in the Nursing Department include Ruth Dieterick, Supervisor-Instructor in the Eye Institute; Mary Ferry, Supervisor in the Operating Rooms; Vivian Helmuth, Supervisor in the Operating Rooms; Alice Higgins, Evening Supervisor in Babies Hospital, Martha Schunck, Senior Supervisor in the Operating Rooms; Jacqueline Webb, Evening Supervisor in Vanderbilt Clinic; Suzanne Wehrmaker, Supervisor of Staff Development in Neurological Institute; and Cynthia White, Clinical Coordinator in Medicine.

Thirty-one students completed the requirements for the baccalaureate degree in June and 82 in July 1972. Seven graduates received their Masters degree in Psychiatric-Community Mental Health Nursing and 12 in Maternity Nursing and Nurse-Midwifery. One hundred fifty-three students from 7 Affiliating Diploma Schools of Nursing completed a ten weeks course in the nursing of children at Babies Hospital. The following students were selected for graduation awards: Margaret Eliot Prize, Ruthe Boyea and Celeste Yanni; Sigma

Theta Tau Award, Susan Krienke, Marguerite Brown and Celeste Yanni; and the Arlene Meyers Award, Joan Stackhouse.

The Department of Nursing was awarded full accreditation by the Department of Baccalaureate and Higher Degree Programs of the National League for Nursing following a three day accreditation visit in October 1971. Major curriculum changes this year include revision of courses resulting in the shortening of the summer session. New courses were introduced and several courses previously offered, were eliminated. The course in public health nursing has been experimenting with multiple community agency assignments. Students and faculty in this course have been responsible for the development of two podiatry clinics in the community. Integrated Psych-Soc classes, consisting of 10 nursing students and 10 medical students, were also introduced this Fall. The Graduate Program in Maternity Nursing and Nurse-Midwifery was awarded a grant by the Division of Maternal and Child Health Services, Department of Health, Education and Welfare, which will enable it to increase faculty and expand clinical facilities thus providing for an expanded student enrollment.

The study of the potential for reorganization and extension of the baccalaureate program in nursing at Columbia University, funded by the Division of Nursing, National Institute of Health, Department of Health, Education and Welfare, was completed in July 1972. A new grant was approved in June 1972. This grant will support the development of a generic program in nursing for a period of four years or until the first class is graduated. The facilities of Barnard College and the School of General Studies have approved in principle the proposal to have qualified students enroll in liberal arts courses at these schools as part of a baccalaureate program in nursing. St. Luke's Hospital Center has agreed to provide housing for freshman and sophomore students and needed classrooms and offices for these two years. Although the grant has not yet been funded, recruitment has begun for the Fall 1973. Through St. Luke's Hospital Center, an anonymous benefactor has agreed to provide funds for planning for the first academic year until the grant is funded. Transfer students will continue to be accepted by the Department of Nursing as part of the present program until the new program is phased in, and then as part of the new program.

Miss Eura Lennon served as psychiatric nursing consultant to the Department of Psychiatry, Harlem Hospital. She spoke at the Third Annual

Workshop sponsored by the Brooklyn Tuberculosis and Respiratory Disease Association at Long Island University in September 1972 on "Psychological considerations of patients and their families." Fern Kumler was elected to the Executive Board of the Society of Certified Clinical Specialists in Psychiatric Nursing of the New Jersey Nurses Association and appointed to the Interim Certification Board of the American Nurses Association. She spoke at the Annual Conference of Clinical Specialists at Rutgers University in December 1971 on "What is a Masters Degree For?" She has also been serving as clinical consultant for the South Beach Psychiatric Center. Dr. Ann Earle was elected to the Executive Committee of the Columbia Chapter of the American Association of University Professors and served as consultant for the Evaluation Unit of the Department of Community Health, Albert Einstein College of Medicine. Carole Kaufmann served as co-chairman for the Annual Convention of the American College of Nurse-Midwives and as consultant to Georgetown University and to University of Vermont, both of whom are considering the establishment of a nurse-midwifery program. Nancy Sargis served as chairman of the Council on Economic and General Welfare Committee and of the Human Relations Committee of the New York State Nurses Association. She spoke on "Economic and General Welfare—The Here and Now" at the New York State Nurses Association Convention in October 1972. She is a member of the Board of Directors, District #13 of the New York State Nurses Association. Elizabeth Mahoney served as chairman of the Program Committee of the Westchester Chapter of the Catholic Nurses Association and as vice-president of the Westchester Chapter Association of Operating Room Nurses. Elizabeth Carter served as chairman of the Psychiatric Mental Conference Group of District #13, New York State Nurses Association and of the Task Force for Establishing The Council of Advanced Practitioners in Psychiatric-Mental Health Nursing. A talk on "The Concepts of Control: Its Place in the Nurse-Patient Relationship" was presented at Catholic University of America in March 1972. Edward Wray served as chairman of the Psychiatric Mental Health Conference Group of the New York State Nurses Association and as First Vice President of District #13.

The Student Scholarship Fund Benefit Bridge Committee, whose members include mothers of students, alumnae of the school, and Medical Center wives, contributed \$18,178 in scholarship funds.

this year. Other scholarship funds for nursing students were donated by the John A. Hartford Foundation, the Quaker Hill Foundation, the National Foundation for Graduate Nurse Education, the Columbia University-Presbyterian Hospital School of Nursing Alumnae Association, and the Presbyterian Hospital Women's Auxilliary. Scholarship awards were received for graduate and undergraduate students from the Department of Health, Education and Welfare.

The Columbia-Presbyterian School of Practical Nursing was accredited by the National Association for Practical Nurse Education and Service in the Spring of 1972. Eighteen students graduated in April and 31 in September 1972. Edith Ankers participated in a conference on issues in licensed practical nursing held by the National Commission for the Study of Nursing and Nursing Education in Rochester, New York. Four students graduated from the Presbyterian Hospital School of Operating Room Technology in December 1971 and five in May 1972.

Forty-two nurses from 20 countries in South America, Europe and Asia completed the one year Exchange Visitor program. Twenty graduates from the past two groups have elected to come on staff. Unfortunately, due to economic pressures, the program will be suspended indefinitely after the present group completes its year in April 1973.

Staff Development Programs were completed by the following members of the nursing staff:

nurses aides and attendants (6 weeks course)	39
nurses aides and attendants (3 weeks course)	4
ward clerks (2 weeks course for new employees)	7
ward clerks (20 hour course for employees)	8
nurses and licensed practical nurses pharmacology review (40 hours) .	147
leadership development	50
orientation (20 hours)	355
surgical intensive care unit (8 weeks course)	30

The number and variety of positions in the Nursing Department increased this year. Harkness Pavillion opened a new twenty bed unit. Vanderbilt Clinic appointed a Medical Nurse Practitioner, Linda Habif and two Nurse Screeners, Aleta Kinley and Mary Moran. Catherine Towey has been appointed Medical Nurse Practitioner in the Thromboembolic Clinic. Surgery opened an Intensive Care Unit and employed a Surgical Clinical Specialist. Medicine employed a Medical Clinical Specialist and is now hiring for a Hemodialysis Unit. Babies Hospital opened a Clinical Research Unit and is looking forward to a new Transitional Nursery and a Neonatal Mobile Unit.

The Ward Manager program is progressing on schedule. The Ward Managers have assumed full responsibility for ward clerk training and orientation. A pilot study of utilization of nursing personnel has been completed on the third floor of the Neurological Institute. It is anticipated that the methodology developed will be applied to other areas of the Medical Center.

In addition to educational programs for nurses and schools of nursing in the northeast region, the nursing staff of the Neurological Institute have developed a special education work study program for students at the George Washington High School in Manhattan. Martha Haber continues to serve on the Executive Committee of the Joint Committee for Stroke Facilities. Lynn Chicchio was the first recipient of an award to an outstanding Neurosurgical nurse established in honor of the late Arline Gleason.

In January 1972, a Nursing Workshop on "Caring for the Dying Child and his Family" jointly sponsored by nursing service and nursing education in Babies Hospital, was attended by some 200 pediatric nurses from the Northeast Region as well as some 400 members of the Medical Center. Dorothy del Bueno led a workshop entitled "Evaluation of a Training Program" at the Conference of the American Society for Hospital Education and Training, June 1972. Ilea Lebron has been appearing on Television Station, Channel 41 presenting information on maternal and child health in Spanish.

1972 Publications

Nursing

Brady, M. Ursula

Institutional care: Summary of a two day workshop. Columbia University Press, 1972

Britten, Mary X.

Nursing workshop: Summary of a two day group workshop. Columbia University Press, 1972

Buschman, P.; Sheets, S.; Tierny, J.; Wharton, A.;

Use of psychopharmacologic agents in terminally ill patients. Columbia University Press, 1972

del Bueno, Dorothy

Leadership development for head nurses. *R. N. Magazine*. 34:38-44, 1971.

Verifying the nurses knowledge of pharmacology. *Nursing Outlook*, 20:462-463, 1972

Ehmann, Virginia

Empathy: Its origin, characteristics and process. *Perspectives in Psychiatric Care*, 9:72-80, 1971.

Rayner, Ruth and Jones, Bonnie

Selected problems of adaptation of the exchange-visitor nurse and the seminar approach. *International Nursing Review*, 19:10-149, 1972.

Sargis, Nancy

Cardiogenic shock. *Journal of the New York State Nurses Association*, 3:22-28, 1972.

Wray, Edward O.

A psychiatric nurse looks at the psychiatrist. *Psychiatric Opinion*, 9:26-30, 1972.

Obstetrics and Gynecology

RAYMOND L. VANDE WIELE

Rapleye Professor and Chairman of the Department • Director of Service

Teaching

Changes in Staff

Dr. Virgil G. Damon, for many years one of our most distinguished clinicians, died at the age of 77. Dr. Alvin J. Tillman, who joined Sloane Hospital in 1931, died at the age of 68. A member of our staff for 38 years, Dr. Tillman devoted his whole medical career to the care and study of patients with pre-eclampsia and other medical complications of pregnancy. His dream was to distill his enormous clinical experience into a book on this subject, but unfortunately he died before completing it.

New members of our professorial staff included Dr. Anne Pierson at the Sloane Hospital, Dr. Meredith Sirmans and Dr. Trishit Mukherjee at the Harlem Hospital. Dr. Donald P. Swartz resigned as Director of the Harlem Hospital Service and Dr. Robert D. Patchell was made Acting Director.

Changes in Curriculum

The use of audiovisual aids in the teaching of the core of the specialty has been found successful and is being expanded. Dr. Richard Friedman is organizing a course in human sexuality that will be integrated in our clinical teaching. An increasing number of students have taken their clinical rotations in Obstetrics and Gynecology at the affiliated hospitals.

Research

Genetics

The laboratory under the direction of Dr. Orlando J. Miller has continued its studies of chromosome

changes as causes of human disease, in collaboration with Dr. W. Roy Breg, Department of Pediatrics, Yale University of Medicine. Dr. Vaithilingham G. Dev and Dr. Dorothy Warburton (Human Genetics and Development) have shown that calcium and magnesium ions influence the production of chromosome banding. Dr. Dev, Dr. Warburton, and Dr. Dorothy A. Miller, in collaboration with Dr. Bernard F. Erlanger and Dr. Sam M. Beiser (Microbiology), have shown that antisera which react specifically with adenosine produce a pattern of chromosome banding quite similar to that of quinacrine or the usual G-banding techniques, indicating that differences in the base composition of DNA along the chromosomes may be responsible for the banding. Dr. Dev, Dr. D. A. Miller and Dr. Penelope W. Allderdice have developed a simplified method for producing C-banding of mouse chromosomes. With Dr. K. H. Grzeschik, A. Grzeschik and Dr. M. Siniscalco of the Department of Genetics, Albert Einstein College of Medicine, and Dr. J. M. Opitz of the Department of Human Genetics, University of Wisconsin, Dr. Allderdice has shown that the human phosphoglycerate kinase gene locus is on the long arm of the X chromosome. Other research of this group is described in the report of the Department of Human Genetics and Development.

The laboratory of Dr. Georgiana Jagiello has continued to study mammalian meiosis with emphasis on development of an evolutionary scheme for meiotic characteristics and the detection and induction of abnormalities *in vitro* and *in vivo*. Studies by Dr. J. S. Fang of the mitotic complement of cul-

tured human ovarian material suggest an effect of aging upon chromosome loss, numerical and structural mixoploidy and the incidence of precancerous clones. In collaboration with Dr. Wayne Miller, cultures of isolated intact ovarian follicles from *Ovis aries*, *Macaca mulatta* and *Bos taurus* have been established, and the effects of various gonadotropin and steroid hormone dosages are being studied. In collaboration with Dr. Richard Hochberg, Dr. Miller is examining the rate of side chain cleavage of cholesterol in various steroidegenic tissues *in vitro*.

Dr. Raphael Jewelewicz has perfected a method to recover oocytes by laparoscopy. This approach is being used to assess various oocyte recovery units and to detect abnormal oocyte carrier states in infertile women. With Drs. Wylie Hembree and Dr. Nicholas Romas (Urology) a study of meiotic and mitotic abnormalities of infertile males has begun. The collaboration with Dr. Ross Grey (Institute of Comparative Medicine), has continued on studies of the unique meiotic characteristics of *Felis domesticus*, and *Caninus familiaris*, as well as the mitotic characteristics of gonadal agenesis in male rabbits.

In addition, the general effort of the laboratory has been devoted to the long term study of the *in vitro* and *in vivo* meiotic behavior of human oocytes as a function of multiple anamnestic parameters, an analysis of euploidy in the rat ovum following foreshortened superovulation, the chromosome mutagenic actions of environmental and pharmacologic agents on mammalian oocytes and ovulation, and continuing investigations into the electron microscopy of the formation, nature and fate of the mid-body and polar body of mammalian eggs.

Reproductive Biochemistry

The laboratory under the direction of Dr. Seymour Lieberman, continues its studies of the biochemistry and metabolism of the steroid hormones. Studies of Dr. Hochberg and Dr. Patrick D. McDonald suggest that the conversion of cholesterol to pregnenolone involves a steroid oxygen-metaloenzyme complex that is cleaved to yield the product, pregnenolone, directly. A variety of analogs of cholesterol blocked at Carbon 22 have been synthesized and have been found to be efficient inhibitors of the conversion of cholesterol to the C_{21} steroid.

Dr. Paula Zimmering is continuing her investigations of the effect of estrogens on the "minor nucleosides" present in the ribonucleic acids of uterine tissue. Dr. Laura Ponticorvo, investigating the metabolic products formed during *in vitro* incubations

of cholesterol sulfate (labeled with 3H and ^{35}S), has demonstrated the direct conversion of cholesterol sulfate to dehydroisoandrosterone sulfate by the particulate fraction of mouse testis. Dr. Fred Chasalow is studying the enzymes catalyzing steroid-17-hydroxylase activity to determine whether 17 hydroxylated compounds are true intermediates of the hormones rather than by-products of the biosynthetic processes.

Three graduate students in biochemistry are presently working in this laboratory. Mrs. Violet Lippman is completing her investigation into the biosynthetic origin and mechanism of formation of the pheromones, the $C_{19}-\Delta^{16}$ steroids. Mr. Frank Gasparini is attempting to confirm the report that human breast cancer tissue can convert cholesterol into pregnenolone and androstenedione into estrogens. Miss Marie Monaco is studying steroidal precursors of estrogens formed by rat testes.

Dr. Hembree has extended his novel tritium labeling technique to numerous compounds of biologic interest, including human gonadotropins, morphine, fatty acids and amino acids. Dr. Richard Ehrenkauf and Dr. Hembree, in continuing collaboration with Dr. A. P. Wolf of the Department of Chemistry at the Brookhaven National Laboratories, have further clarified the tritium labeling reaction mechanism and its advantages over the classic "Wilzbach" gas exposure methods and have characterized the chemistry of the reaction with peptides.

At Woman's Hospital, St. Luke's Hospital Center, the laboratory of Dr. William G. Kelly is studying the role of 19-hydroxy- Δ^4 -androstenedione as a precursor of estrogens. With Dr. Victor Bokkenheuser (Pathology), Dr. Kelly has demonstrated that anaerobic organisms from human feces are capable of removing the 21-hydroxyl group from corticosteroids. The synthesis of metabolites of aldosterone progressed under the charge of Dr. Stuart Polovsky.

Reproductive Endocrinology

R. Jeffrey Bogumil (School of Engineering) and Dr. Michel Ferin have completed the construction of a mathematical model of the human menstrual cycle and have studied the performance of the model by computer techniques. Some of the hypotheses generated by their studies are being studied experimentally by Drs. Jewelewicz and Ferin. Together with Dr. R. Ans and Dr. S. Khalaf they are studying the release of LH and FSH after administration of synthetic GnRH (Gonadotropin Releasing Hormone) in various endocrine conditions in humans as well as in monkeys. Together with Dr. U. Joshi and Dr. Inge Dyrenfurth, Dr. Jewelewicz

studied the luteolytic activity of estrogens during the luteal phase of the cycle. Dr. Dyrenfurth has made an in-depth study of the temporal relationships of hormonal variables in 56 menstrual cycles. Dr. Joshi has studied the changes in salivary estrogens during the menstrual cycle. Dr. Michelle Warren and Dr. J. Silverman (Pediatrics) have developed a study of the clinical and laboratory features of anorexia nervosa.

Drs. Ferin and Dyrenfurth have shown that, after immunization with an estradiol-protein conjugate, cycling monkeys become anovulatory but are able to release LH after diethylstilbestrol. Dr. Peter Carmel (Neurosurgery), Dr. Earl Zimmerman (Neurology) and Dr. Ferin have continued their studies in reproductive neuroendocrinology. The precise location in the hypothalamus of the site for the inhibitory as well as stimulatory feedback of estrogens on LH has been studied in rhesus monkeys. Using immunoperoxidase techniques, Dr. Zimmerman has studied the localization of neurophysins in the hypothalamus.

Dr. Ines Mandl with Dr. Mary Parshley have studied factors affecting ovarian follicular rupture, including collagenase activity.

Studies of patients with male infertility are being conducted by Dr. Hembree. These include the dynamic testing of testicular function as well as the incidence of testicular mitotic and meiotic chromosome abnormalities (in collaboration with Dr. Jagiello). James Overstreet is evaluating human gamete interaction as an index of fertility and Allan Olson is studying testicular gonadotropin receptors.

At the Harlem Hospital Center, Dr. Muriel Feigelson has continued her search for specific proteins in oviductal and uterine fluids.

Maternal and Child Health

The organization of a Perinatal Division incorporating the activities of members of the Departments of Obstetrics and Gynecology, Pediatrics and Anesthesiology has greatly increased our research potential in this area of our discipline. Some of the research activities of the division are being supported by a SCOR grant from the National Heart and Lung Institute and are described in some detail in the pediatric report. Included in these is a longitudinal study of respiratory distress syndrome where clinical information is being collected prospectively from the obstetric clinic, during labor and delivery, and in the neonatal intensive care unit. Other support for research in the division is from the program project grant in the Department of Anesthesiology. This research which is focusing on the mechanism

of heart-rate changes during labor, the etiology of the respiratory distress syndrome, and fetal pharmacology, is described in some detail in the report from the Department of Anesthesiology.

Dr. L. Stanley James and co-workers have developed an experimental model in the subhuman primate where the cardiovascular and acid-base state of the near-term fetus can be directly monitored during labor. Using this model, they demonstrated that fetal hypoxia is the essential component producing "late deceleration" of the heart rate. The inhibiting action of diazoxide, a smooth muscle relaxant on spontaneous and induced labor has been studied in the same experimental model. Infusion of diazoxide resulted in a fall in arterial blood pressure and a rise in heart rate in both mother and fetus. The effectiveness of diazoxide in suppressing uterine activity was confirmed. However, the dose of diazoxide necessary to suppress well established labor also caused significant maternal and fetal hypotension.

Dr. Edward T. Bowe, with Dr. Salha Daniel (Anesthesiology), has utilized the fetal sheep chronic catheter preparation to study the renal response to acid loading in the developing sheep fetus, and fetal renal function during stress. With Drs. Daniel and Allen Hyman (Anesthesiology) and R. Dell (Pediatrics), Dr. Bowe has completed a study of the distribution of albumin in interstitial fluid space of fetal lung.

Dr. Ines Mandl has continued to study the pulmonary biochemical characteristics in respiratory distress syndrome (RDS) of the newborn. An earlier observation that infants with RDS have a significant decrease in antitrypsin activity was confirmed. In collaboration with Dr. Joshua A. Fierer (Pathology) Dr. Mandl has investigated by immunofluorescent techniques α_1 -antitrypsin localization in lungs of newborn presumed RDS cases. Analyses of the amino acid composition of elastin isolated from lung tissue of neonates who died with RDS suggest that in premature newborns pulmonary elastin biosynthesis is incomplete, a fact which may predispose to the disease.

Dr. Bowe has investigated the impact of the application of modern antepartum monitoring methods upon statistics related to perinatal mortality and morbidity. Review of over 500 high risk pregnancies and their outcome managed in the Perinatal Clinic has shown a significant reduction in expected perinatal mortality rate for the offspring and a reduction in spontaneous abortion and prematurity rates below those for normal antepartum clinic patients, as well as a reduction in the expected mor-

idity rate for those newborns as judged by Apgar Scores.

Drs. Vincent J. Freda and Bowe have continued their investigations in patients with erythroblastosis fetalis. To date 157 babies have been transfused *in utero*. In the 1971-72 period the percentage of hydropic fetuses was 64 per cent, of live births was 45 percent and of survivors was 18 per cent. A total of 172 of the 497 mothers in the clinical trial of RhoGAM have delivered subsequent Rh positive babies. None of the 139 treated mothers were sensitized at the time of this subsequent delivery whereas four of the 33 control mothers were immunized and their babies affected. Twenty of the above 139 treated mothers have delivered a third unaffected Rh positive baby. RhoGAM protection is complete at the second Rh positive pregnancy in our Columbia-Presbyterian study.

A study of Dr. Charles M. Steer of infections in patients delivered by cesarean section revealed an alarmingly high infection rate as well as a definite change in flora.

At the Harlem Hospital Center, Dr. Feigelson has continued her studies of the development and control in fetal liver of the enzyme histidase.

At St. Luke's Hospital Center, Dr. Kelly has developed a radioimmunoassay method to measure plasma estriol in normal and pathological pregnancies.

Neoplastic Disease

Members of the Division of Obstetrical and Gynecological Pathology under the direction of Dr. Ralph M. Richart have studied a variety of neoplasms of the female genital tract using transmission and scanning electron microscopy. The scanning electron microscope studies have provided additional information regarding changes in cell surface specialization and alterations that occur during the transformation of a normal to a neoplastic cell. In particular, Dr. Richart and Dr. Alex Frecenzy have made a study of ciliogenesis in endometrial adenocarcinoma indicating a progressive loss of ciliogenesis with decreasing differentiation of the tumor.

Drs. Mandl, Stephen Keller and Carlton Blackwood have continued to screen tumor tissues and cells for specific collagenases. Collagenolytic activity against native collagen was detectable in fresh tissues and in cells derived from ovarian tumors. Dr. Parshley has maintained lines of human cervical, ovarian, and breast carcinoma cells in tissue culture for assay of the carcinocidal effect of a number of biologically active agents. Dr. Parshley studied histochemical preparations of long-term tissue cultures

of lungs of mice treated with tobacco smoke and found significant changes in the cell characteristics of smoke treated mice.

Dr. Henry Clay Frick, II, in collaboration with Dr. George Hyman (Medicine), continues to evaluate various chemotherapeutic agents in the treatment of advanced ovarian cancer. With Dr. Thomas F. Halpin and Dr. Equinn W. Munnell, Dr. Frick has completed a study of persistent and recurrent cases of carcinoma of the cervix at the Presbyterian and Delafield Hospitals during the years 1955 through 1964. Drs. Frick, Munnell, and Richart reviewed the cases of carcinoma of the endometrium treated at the Presbyterian and Delafield Hospitals during the ten-year period 1956-1965.

At St. Luke's Hospital Center, Dr. Tawfik Rizkallah with Dr. Kelly, studying the fractional conversion of androstenedione to estrogen, found this conversion to be higher in women with endometrial carcinoma than in matched controls.

Family Life Services

Dr. Elizabeth B. Connell and members of the Family Life Services Staff have continued studies on newer contraceptive technique such as the Copper-T intrauterine device and low estrogen oral contraceptives. Similar studies are being carried out at the Roosevelt Hospital.

Dr. Robert S. Neuwirth and Dr. Richart have developed a transuterine method of sterilization. This work is described in more detail in the report of the International Institute for the Study of Human Reproduction.

Dr. Robert E. Hall has completed a five-year comparative study of various contraceptive methods among 8500 clinic patients.

At the Roosevelt Hospital a study of the abortifacient effect of prostaglandin in midtrimester pregnancies has been completed.

Acknowledgment

Recognition of the great assistance given to the department by a number of outside sources is again due. The Health Research Council of the City of New York again provided support for faculty.

A major part of the research work of the department has been made possible by grants from the United States Public Health Service, the United States Atomic Energy Commission, the Office for Economic Opportunity, and the City of New York Department of Health. Additional research support was derived from many private foundations including the following: The Population Council, Damor Runyon Memorial Fund for Cancer Research, the

National Foundation, the Arthritis Foundation, Inc., New York Chapter, the Ford Foundation, the Rockefeller Foundation, the New York Polyclinic Medical School, the John and Mary R. Markle Foundation. Several industrial organizations have also supported the research programs of the department including: The Council for Tobacco Research, USA, Hoffman-La Roche, the Upjohn Company, Chemical Research and Manufacturers, Inc., Agricultural Biologicals Corporation, and the Ortho-Research Foundation. The department gratefully acknowledges generous gifts from Ann Belford Planov and Dr. Henry Clay Frick. Finally, contributions too numerous to acknowledge individually were received by the department in memory of Dr. Virgil Damon. Several contributions were also received in memory of Mrs. Rhoda Weber.

Patient Care

Reference has already been made to the Division of Perinatal Medicine that has been organized within the Departments of Obstetrics and Gynecology, Pediatrics and Anesthesiology. Dr. L. Stanley James (Pediatrics) was appointed as Director of the Division for a term of two years. Dr. W. Duane Todd has been appointed as Chief of the Obstetrical Service for the same period. The establishment of this Division officially recognizes important interdepartmental activities that have been in operation for a number of years. A principal objective of the division is the integration of the activities of the involved departments. One of its major achievements during the first year has been the formulation of long-range plans for updating of the procedures in the labor room. It is hoped that the introduction of new technology and principles of intensive care, which have been so important in medicine and surgery, will lead to improvements both with regard to fetal mortality and fetal morbidity. A special Newborn Unit and Transitional Nursery has been constructed within the delivery suite. In this unit, intensive observation and care will be carried out during the critical first few hours of life.

The Family Life Services Staff, under the direction of Dr. Elizabeth Connell, has continued to expand its program to provide additional services to the patients of the Columbia-Presbyterian Medical Center and the surrounding community. A novel feature of their operation has been the introduction of patient group activities which have been found to be very successful.

Dr. Neuwirth, who has rejoined our department on a full time basis, is organizing an Endoscopy Unit.

At the Harlem Hospital, the service has made a major effort in the last year to maintain various program activities which have been developed since 1962. However, some programs are at serious risk of collapsing entirely or undergoing marked reduction in their activity due to the current curtailment or even cessation of outside funding coupled with restrictions in the department budget and in the control of its management. Programs that are presently in jeopardy are the very successful evening family planning clinic services. A methadone maintenance program has been established.

Clinical Report

The alarming decrease in our delivery rate throughout the years 1970-1971 has stopped and in fact in 1972 there was a modest increase in our ward delivery rate. A similar increase in the number of gynecological operations is equally gratifying and bodes well for the future. On the other hand, there has been a further decrease in the private delivery rate, reflecting to some degree the retirement of several of our most distinguished obstetricians, and pointing to a need for further recruitment. The number of cancer patients at the Columbia-Presbyterian Medical Center has been stable but there has been a further decline in admissions to the Delafield Hospital. The only maternal death in 1972 was that of a 27 year old patient who delivered in October 1971 and died in February 1972 from a leiomyosarcoma of the maxillary space.

There has been a rapid expansion of the monitoring unit in the Labor Room and in excess of 25 per cent of our patients in labor are now being monitored. The plans to equip the Labor Room with the most sophisticated electronic equipment are progressing satisfactorily and the High Risk Unit should be fully operational by the middle of 1973. The construction of the Transitional Nursery has been completed, and its personnel has been recruited and are now in training.

An increasing number of minor surgical interventions are being switched from the 18th floor operating rooms to the 16th floor surgical unit. Whereas up to now this unit was used only for abortions, it serves now as a very effective Ambulatory Surgical Unit for sterilization procedures and gynecological endoscopy.

Clinical Report

TABLE 1

CLINIC VISITS

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Obstetrical	26,041	29,333	35,125	33,185	33,504
Gynecological	21,398	18,178	15,894	14,915	15,380
Total	47,439	47,511	51,019	48,100	48,884

TABLE 2

VIABLE DELIVERIES

	<u>1959-1968 Average</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Ward	3,034	3,072	2,584	2,147	2,222
Semi-Private	712	671	756	739	705
Private	651	584	604	508	426
Total	4,397	4,327	3,944	3,394	3,353

TABLE 3

PERINATAL MORTALITY

	<u>1959-1968 Average</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Ward	23.3/M	20.6/M	25.7/M	21.6/M	19.8/M
Private and Semi-Private	19.6/M	29.4/M	19.7/M	24.0/M	18.1/M

M — per thousand viable births (more than 1000 grams)

TABLE 4

RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

<u>Weight in Grams</u>	<u>Total Births</u>	<u>Total Perinatal Deaths</u>	<u>1972 Per Cent Perinatal Mortality</u>
500 - 1,000	40	39	97.5
1,000 - 1,500	32	25	78.2
1,500 - 2,000	60	12	20.0
2,000 - 2,500	177	7	4.0
Over - 2,500	3,070	21	0.7
Total	3,379	104	3.1

TABLE 5

OPERATIVE DELIVERIES

	<u>Ward</u>	<u>Private & Semi-Private</u>	<u>Total</u>
Cesarean Sections	270 (12.1%)	182 (16.1%)	452 (13.5%)
Primary	183	109	292
Repeat	109	73	160
Mid Forceps	105	75	180 (5.4%)
Low Forceps	335	253	588 (17.5%)
Breech Deliveries	61	33	94

TABLE 6
GYNECOLOGIC OPERATIONS

	<u>1959-1968 Average</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Ward	897	730	630	603	655
Semi-Private	585	535	569	553	553
Private	454	492	507	496	485
Total	1,936	1,757	1,706	1,652	1,693

TABLE 7
CASES OF GYNECOLOGIC CANCER TREATED OR UNDER OBSERVANCE
DURING EACH OF YEARS FROM 1957-1972

	<u>Total Patients Followed</u>	<u>The Presbyterian</u>		<u>Francis Delafield</u>
		<u>Ward</u>	<u>Private</u>	
1957	1,950	850	696	404
1958	1,883	853	612	418
1959	1,945	920	618	407
1960	2,248	1,084	696	468
1961	2,384	1,180	732	472
1962	2,601	1,319	801	481
1963	2,851	1,527	783	541
1964	3,198	1,752	852	594
1965	3,633	2,015	930	688
1966	3,581	2,282	850	449
1967	3,577	2,301	901	375
1968	2,396	1,281	742	373
1969	2,110	1,045	817	248
1970	2,003	966	752	285
1971	2,169	1,095	779	295
1972	1,996	966	780	250

Submitted January 1973

1972 Publications

Obstetrics and Gynecology

Bokkenheuser, V.; Kelly, W. G. and Suzuki, J. B.

Alterations of hormones by bacterial flora of the intestinal tract: *in vitro* formation of pregnanolone from deoxycorticosterone. *Abstracts of the Annual Meeting of the American Society for Microbiology* 1972, p. 118.

Breg, W. R.; Allderice, P. W.; Miller, D. A. and Miller, O. J.

Quinacrine fluorescence patterns and terminal DNA labelling of human C group chromosomes. *Nature, New Biol.* **236**:76, 1972.

Breg, W. R.; Miller, D. A.; Allderice, P. W. and Miller, O. J.

Identification of translocation chromosomes by quinacrine fluorescence. *Am. J. Dis. Child.* **123**:561, 1972.

Cantor, B.; Jewelewicz, R.; Warren, M.; Dyrenfurth, I.; Patner, A. and Vande Wiele, R. L.

Hormonal changes during induction of midtrimester abortion by Prostaglandin F_{2a}. *Am. J. Obst. & Gynec.* **113**:607, 1972.

Carmel, P. W.; Ferin, M.; Zimmerman, E. A.; Warren, M. P. and Vande Wiele, R. L.

Hypothalamic sites for estrogen control of LH secretion in monkeys. *Abstract Proceedings of IV International Congress of Endocrinology, Washington, D. C., 1972.*

Connell, Elizabeth B.

Preoperative screening and work-up. *Abortion Techniques and Services, Excerpta Medica* **255**:3, 1971.

Blood clotting and the pill. *Ob.-Gyn. Collected Letters* **12**:191, 1971.

- Connell, Elizabeth B.
The IUD: Sex without pregnancy. *Medical Aspects of Human Sexuality* 6:142, 1972.
- Gynecologic symptoms of sexual problems. *Ortho-Panel-Management of Sexual Problems in Medical Practice* 13:1, 1972.
- Legal abortion and the hospital's role. *Hospital Practice* 7:143, 1972.
- Endometrial histochemistry. In: *Excerpta Medica Reproductive Biology*, Howard Balin and Stanley Glaser, eds., p. 727, 1972.
- The pill in relation to uterine fibromyomas. Questions and answers. *Medical Aspects of Human Sexuality* 6:172, 1972.
- Cowchock, F. Susan; Ferin, Michelle; Dyrenfurth, Inge; Carmel, Peter; Zimmerman, Earl; Brinson, A. and Vande Wiele, Raymond
Active immunization with estradiol 17 β bovine serum albumin in monkeys. In: *Gonadotropins*, Brij. B. Saxena, Carl G. Belling and Hortense M. Gandy, eds., New York, John Wiley & Sons, Inc., 1972.
- Engel, T.; Jewelewicz, R.; Dyrenfurth, I.; Speroff, L. and Vande Wiele, R. L.
Ovarian hyperstimulation syndrome. *Am. J. Obst. & Gynec.* 112:1052, 1972.
- Feigelson, Muriel and Kay, Ernest
Protein patterns of rabbit oviducal fluid. *Biol. Reprod.* 6:244, 1972.
- Freda, Vincent J.
The control of Rh disease. In: *Immunobiology*, R. A. Good and D. W. Fisher, eds., Stamford, Conn., Sinauer Assoc. Inc., 1971, p. 266.
- Prevention of Rh disease. *Haematologia* 6:149, 1972.
- Freda, Vincent J. and Bowe, Edward T.
Hemolytic disease due to Rh sensitization. In: *Current Therapy*, H. Conn, ed., Philadelphia, W. B. Saunders, 1971, p. 252.
- Freda, V. J.; Gorman, J. G.; Galen, R. S. and Treacy, N.
The need for RhoGAM following abortion. *Excerpta Medica International Series* 255:38, 1972.
- Grewal, M. S.; Dev, V. G.; Miller, D. A. and Miller, O. J.
Quinacrine fluorescent patterns of the chromosomes in cell lines of the rat-kangaroo. *Exptl. Cell Res.* 69: 241, 1971.
- Hall, Robert E.
The emotional conflicts behind an abortion. *Medical Insight*, 1972, p. 23.
- Time limitation in induced abortion. *Association for the Study of Abortion Reprint*, 1972.
- The medicolegal aspects of abortion. In: *Obstetrics and Gynecology Annual*. Ralph M. Wynn, ed., New York, Appleton-Century-Crofts, 1972, p. 339.
- Sex and Marriage* (Revised). Planned Parenthood-World Population 1972.
- Nine Months' Reading. A Medical Guide for Pregnant Women*. New Revised Edition, New York, Doubleday & Co., Inc., 1972.
- Himsworth, R. A.; Carmel, P. W. and Frantz, A. J.
Location of hypothalamic mediation of growth hormone release in response to hypoglycemia. *Endocrinology* 91:217, 1972.
- Jewelewicz, R.; Cantor, B.; Dyrenfurth, I.; Warren, M. P. and Vande Wiele, R. L.
Intravenous infusion of Prostaglandin F $_{2\alpha}$ in the mid-luteal phase of the normal human menstrual cycle. *Prostaglandins* 1:443, 1972.
- Jewelewicz, R.; Dyrenfurth, I.; Warren, M. P. and Vande Wiele, R. L.
Ovarian hyperstimulation syndrome — Relationship between pre-ovulatory estrogen levels and ovarian hyperstimulation in gonadotropin-treated patients. *Serono Foundation Workshop Conference on "Gonadotropin Therapy in Female Infertility" May 12-13, 1972, Worcester, Massachusetts.*
- Jewelewicz, Raphael; James, Stanley L.; Finster, Mieczyslaw; Dyrenfurth, Inge; Warren, Michelle P. and Vande Wiele, Raymond L.
Quintuplet gestation after ovulation induction with menopausal gonadotropins and pituitary luteinizing hormone. *Obst. & Gynec.* 40:1, 1972.
- Kay, Ernest and Feigelson, Muriel
An estrogen modulated protein in rabbit oviducal fluid. *Biochem. Biophys. Acta* 271:436, 1972.
- Keller, S. and Mandl, I.
Qualitative differences between normal and emphysematous human lung elastin. In: *Pulmonary Emphysema and Proteolysis*. C. Mittman, ed., New York. Academic Press, p. 251, 1972.
- Solubilized elastin as a substrate for elastin and elastase inhibitor determinations. *Biochem. Med.* 5:342 1972.
- Kelly, W. G.
Book review. Monographs on Endocrinology, Volume 5. Regulation of aldosterone biosynthesis. Jurg Muller, New York, Springer Verlag. *Circulation* 46 414, 1972.
- Levine, R. U. and Neuwirth, R. S.
Evaluation of a method of hysteroscopy employing 30% dextran. *Am. J. Obst. & Gynec.* 113:696, 1972.
- Luttrell, Brian; Hochberg, Richard B.; Dixon, W. Ross McDonald, Patrick D. and Lieberman, Seymour
Studies on the biosynthetic conversion of cholesterol into pregnenolone. Side chain cleavage of a t-Buty analog of 20 α -Hydroxycholesterol, (20R)-20-t-Buty 5-pregnene-3 α , 20-diol. A compound completely substituted at C-22. *J. Biol. Chem.* 247:1462, 1972.
- Mandl, I.
Collagenase comes of age. In: *Collagenase; First Interdisciplinary Symposium*. I. Mandl, ed., Gordo and Breach Science Publishers, 1972.
- Mandl, I.; Keller, S.; Hosannah, Y. and Blackwood, C.
Induction and prevention of experimental emphysema. In: *Pulmonary Emphysema and Proteolysis*. C. Mittman, ed., New York Academic Press, p. 43 1972.

- Iazzarella, Paul; Okagaki, Takashi and Richart, Ralph M.
Teratoma of the uterine tube. A case report and review of the literature. *Obst. & Gynec.* 39:381, 1972.
- Miller, D. A.; Kouri, R. E.; Dev, V. G.; Grewal, M. S.; Hutton, J. J. and Miller, O. J.
Assignment of four linkage groups to chromosomes to *Mus musculus* and a cytogenetic method for locating their centromeric ends. *Proceedings of the National Academy of Sciences* 68:2699, 1971.
- Miller, O. J.; Miller, D. A.; Allderdice, P. W.; Dev, V. G. and Grewal, M. S.
Quinacrine fluorescent karyotypes of human diploid and heteroploid cell lines. *Cytogenetics* 10:338, 1971.
- Miller, O. J.; Miller, Dorothy A.; Kouri, R. E.; Dev, V. G.; Grewal, M. S. and Hutton, J. J.
Assignment of linkage groups VIII and X to chromosomes in *Mus musculus* and identification of the centromeric end of linkage group I. *Cytogenetics* 10:452, 1971.
- Mueller-Heubach, Eberhard and Adamsons, Karlis
Surveillance of the fetus during the intrapartum period. *The Mount Sinai Journal of Medicine* 38:427, 1971.
- Mueller-Heubach, Eberhard; Myers, Ronald E. and Adamsons, Karlis
Effects of adrenalectomy on pregnancy length in the rhesus monkey. *Am. J. Obst. & Gynec.* 112:221, 1972.
- Mukherjee, Asit B.; Dev, V. G. and Miller, O. J.
Sendai virus-induced cell sorting leading to apparent preferential fusion of like cells. *Experimental Cell Research* 68:130, 1971.
- Munnell, E. W.
Klinik der Ovarialtumoren. In: *Gynäkologie und Geburtshilfe*, O. Käser, et al., eds., Stuttgart, Georg Thieme, Volume 3, p. 647, 1972.
- Nagatsu, Masaaki; Richart, Ralph M. and Lambert, Adrian
Effects of bleomycin on the cell cycle of Ehrlich ascites carcinoma. *Cancer Res.* 32:1966, 1972.
- Neuwirth, Robert S.
Experience with laparoscopic sterilization related to termination of pregnancy. Proceedings of a Symposium, New York, N. Y. June 3-5, 1971. *International Congress Series No. 255, Excerpta Medica*, p. 59.
Un an d'Experience de la Nouvelle Loi Sur L'Avortement A New York. *Fertility Orthogenie* 4:13, 1972.
A method of bilateral ovarian biopsy at laparoscopy in infertility and chronic anovulation. *Fertil. & Steril.* 23:361, 1972.
- Okagaki, Takashi and Richart, Ralph M.
Systemic proliferating angioendotheliomatosis. A case report. *Obst. & Gynec.* 37:377, 1971.
- Raziano, Joseph; Ferin, Michel and Vande Wiele, Raymond L.
Effects of antibodies to extradiol-17 β and to progesterone on nidation and pregnancy in rats. *Endocrinology* 90:1133, 1972.
- Richart, Ralph M. and Prager, Denis J., Editors
Human Sterilization. Springfield, Illinois, Charles C. Thomas, 1972.
- Rodriguez, Modesto; Okagaki, Takashi and Richart, Ralph M.
Mycotic endometritis due to *Candida*. *Obst. & Gynec.* 39:292, 1972.
- Rosner, William and Hochberg, Richard
Corticosteroid-binding globulin in the rat: Isolation and studies of its influence on cortisol action *in vivo*. *Endocrinology* 91:626, 1972.
- Steer, Charles M.
The bony pelvis, Chapter 1. In: *Davis' Gynecology and Obstetrics*, Hagerstown, Maryland, Harper & Row, p. 1, 1971.
- Suzuki, J. B.; Bokkenheuser, V. and Kelly, W. G.
Metabolism of deoxycorticosterone by mixed bacterial flora of human feces. *Abstracts IV International Congress of Endocrinology Excerpta Medica International Congress Series* 256:212, 1972.
- Topal, S.; Neuwirth, R. S. and Lazarevic, B.
Variations of ectopic pregnancy as seen at laparoscopy. *J. Reprod. Med.* 8:26, 1972.
- Weiss, Robert R.; Neuwirth, Robert S. and Friedman, Max M.
Effect of intraamniotic sodium concentration on saline induced abortion. *Obst. & Gynec.* 40:243, 1972.
- Wilson, Fitzpatrick and Swartz, Donald P.
Gunshot and war projectile wounds of the gravid uterus. Case report and review of literature. *J. Nat. M. A.* 64:8, 1972.
Coital injuries of the vagina. *Obst. & Gynec.* 39:182, 1972.
- Zimmerman, E. A.; Hsu, K. C.; Robinson, A. G.; Tannenbaum, M. and Frantz, A. G.
Distribution of intraneuronal neurophysin I in hypothalamic-posterior pituitary neurosecretory material revealed by immunoenzyme techniques. *Excerpta Medica International Congress Series* 256:111, 1972.
- Zimmerman, E. A.; Robinson, A. G.; Carmel, P. W.; Hsu, K. C.; Tannenbaum, M. and Frantz, A. G.
Hypothalamic and cerebrospinal fluid neurophysins. *Clin. Res.* 20:446, 1972.

Ophthalmology

A. GERARD DE VOE

Harkness Professor and Chairman of the Department • Director of Service

1972 has been a significant year in the on-going developmental plans for the department, particularly in the area of teaching and training. Such activities are, perforce, directed largely towards the training of future ophthalmologists. Contact with undergraduates is so limited that we can provide them only with a superficial exposure to the specialty. Nevertheless, it has been productive as indicated by the fact that a high proportion of appointments to our future residency staff has been made from the ranks of P&S students. The entire resident training program has been revised as of July 1st. New appointees arrive on July 1st and are immediately exposed to an intensive five-week indoctrination course during which they are trained in the essential skills necessary to adequately examine a patient with an ophthalmological problem. At the conclusion of this all residents take part in a one-hour seminar lecture series beginning at 7:45 A.M. The rest of the morning is occupied by a three-month rotation through the sub-specialty clinics in all of the clinical areas. The program is so arranged that a complete cycle is developed in 18 months following which it is repeated. Each individual will be exposed to the teaching schedule twice during his three-year residency program. In addition, academically oriented residents are encouraged at the completion of the three-year residency to take an additional fellowship year in a subspecialty area of their own choosing. This has now become almost a necessity for anyone wishing to secure an appointment to our staff. Flexibility in planning permits individuals

to spend time prior to the residency either in basic research or in a related clinical area. We have been highly pleased with the quality of applicants who have accepted appointments during the past several years.

Our teaching efforts are broadened by the continuation of our annual alumni meeting which for the last three years has been open to the public and has steadily shown an increasing attendance. This year 221 individuals attended.

Staff Changes

Dr. Frank D. Carroll, a distinguished authority on the diseases of the optic nerve, retired during the year. He has been on the staff since 1935 and has contributed enormously to the training of many generations of ophthalmologists. Fortunately we will continue to have access to his skills even though he is formally retired.

With deep regret we report the untimely death of Dr. Wilson C. Starr who began his residency here in 1961 and became a member of the attending staff in 1963. It is always distressing to see a young man and the community deprived of the opportunity to benefit from the skills which he has been so long in developing.

New Members of the Staff

Dr. James C. Newton, Assistant Professor of Clinical Ophthalmology, has been appointed Director of the Eye Service at St. Luke's Hospital. Dr. Jesse L. Sigelman has been appointed a Fellow in

Ophthalmology during his research period in biochemistry prior to appointment to the resident staff. Dr. Thaddeus L. Wandel has been appointed Assistant during a year devoted to further biochemical studies. Miss Anita Anderson, Mrs. Louise E. Franzen and Mr. Heinz Rosskothén have been appointed Staff Associates.

Honors

Dr. Charles A. Perera continues as Chairman of the Research and Grant Committee of the National Society to Combat Blindness, Dr. Harold F. Spalter is secretary of the Research to Prevent Blindness. Dr. Arthur Gerard DeVoe has been elected to the Board of Regents to the American College of Surgeons and is currently President of the American Ophthalmological Society. He continues as consultant to the American Board of Ophthalmology; Dr. Ira S. Jones is Chairman to the Section of Ophthalmology of the New York Academy of Medicine. Miss Sally Moore is President of the American Association of Certified Orthoptists and Miss Lynn Stockbridge is Secretary.

Research Activities

Dr. Ethel I. Anderson has been concerned with the effects of corneal deturgescence on the biochemical parameters, adenosine triphosphate (ATP) and magnesium-activated as well as magnesium plus sodium and potassium-activated adenosine triphosphatase (ATPase). Experiments employing various combinations of nutrients to determine the metabolic requirements of the cornea for effective fluid transport, have been interpreted as emphasizing the importance of the nutritional state of the cornea in determining the rate and extent of fluid transport.

Dr. Lazlo Z. Bito using the hibernating woodchuck as a model has demonstrated that corneal swelling *in vitro* is not due to cold *per se* but is the result of the increased vulnerability of the *in vitro* cornea to the metabolic effects of cold. Continuing his studies on prostaglandin transport, he has noted that the ability of the iris-ciliary body to accumulate prostaglandins *in vitro* is inhibited by experimental uveitis. He is attempting to establish the mechanism of this blockage in the hope that its reversal might offer a new therapeutic approach to chronic uveitis.

Dr. Zacharias Dische's laboratory pursues its research on the glycoproteins of the lens, purifying and determining molecular homogeneity of structural glycoprotein fractions by various methods. Characteristic changes during ageing and initial stages of galactose cataract were demonstrated.

In the prosthetics laboratory under the direction of Dr. Hernando Cardona a significant improvement in the results of the keratoprosthesis in chemical burns has been accomplished. Up to the present time nearly 400 human eyes have been operated upon with the original extrusion rate of 25% now being reduced to 8%. In addition to structural modifications in the prosthesis itself, we believe that the use of autologous collagen in the form of periosteum as a preparatory measure in a severely burned cornea has been a significant factor in the overall improvement.

During the past year Dr. Kenneth E. Eakins, on sabbatical leave, has continued his research in the physiological and pathological role of prostaglandins in the eye. In collaboration with workers at the University of London he has studied the release of prostaglandins in ocular inflammation in rabbit and man. He noted that aqueous humor samples from untreated patients with acute anterior uveitis contained substantial amounts of prostaglandin-like activity. Little activity was found in aqueous from patients treated with steroids and none in aqueous from uninflamed eyes. The manner in which prostaglandins are involved in acute anterior uveitis is under study.

During the past year Dr. Jorge Fischbarg has again devoted his attention to a concentrated search on the function of the corneal endothelium. The discovery of an electrical potential difference across the endothelium has been achieved in his laboratory. His main research effort has been devoted to analysis of the connection between this potential difference and the fluid transport across the endothelium. Work on the connection between physiological and biochemical parameters continues in collaboration with Drs. Ethel I. Anderson and Abraham Spector. The electron microscopical appearance of the endothelium and its relation to its physiological functions is being studied in collaboration with Drs. G. Kaye and Frank Hoefle.

In addition to working as liaison between the basic science group and resident teaching, Dr. Joe G. Hollyfield has studied the development of optic vesicles from the frog embryo raised *in vitro*. Preliminary data indicate that when the retina differentiates in the absence of the pigment epithelium the photoreceptor outer segments fail to develop.

Dr. Takeo Iwamoto in collaboration with Dr. A. B. Reese and Dr. M. L. Mund has studied the clinical as well as the light and electron microscopic aspects of a particular type of iris melanoma. With Drs. Ira S. Jones and George M. Howard he has investigated the ultrastructural comparison of

spindle A, spindle B and epithelioid type cells in uveal malignant melanoma. With Dr. B. D. Srinivasan he has been studying the ultrastructure of the nucleoli of the adult rabbit lens in order to determine the mode of secondary lens fiber differentiation.

Dr. Lu-Ku Li in collaboration with Dr. Abraham Spector has been interested in the size and the aggregation mechanism of the calf lens structural protein, alpha crystallin. He has concluded that the increase in the size of alpha-crystallin is related to minor changes in subunits that resulted from changes in the fiber cells as they are more tightly packed toward the nucleus of the lens.

Dr. Wladyslaw Manski has obtained experimental evidence that charge differences between epithelial and endothelial proteins in the mammalian cornea rather than molecular size difference account for the characteristic behavior in the electrical field of epithelial and endothelial proteins. He is also carrying on studies on the isolation and characterization of corneal cell-surface antigens involved in the reaction with the cytotoxic antibody. He has additionally studied the quantitative distribution of serum proteins in the cornea and the primary and secondary reaction in in-bred rats.

Dr. George K. Smelser's research activities during the past year have been in collaboration with two post-doctoral fellows. With Dr. Hidehiko Matsuda he has investigated the experimental pathology of alkali burns as they affect the corneal epithelium and the endothelium and has investigated the early stages of corneal wound healings. With Dr. Shigekazu Uga he has studied the comparative anatomy of the Mullerian cells of the retina and has investigated their differentiation in the rabbit.

Professor Alfred Brini who joined Dr. Smelser's laboratory this year has been engaged in an experimental study of heterochromia iridis. He has been successful in producing the condition in rats and rabbits by a cervical sympathectomy and by chemical sympathectomy using 6-hydroxydopamine.

During the past year Dr. Abraham Spector was on sabbatical leave working on aspects of the mechanism of protein synthesis in the laboratory of Dr. Marianne Manago at the Rothschild Institute de Biologie Physico-Chimique in Paris. In the meantime the activities of the biochemistry section have proceeded vigorously at the Eye Institute. The implication is becoming increasingly clear that alpha crystallin can under certain conditions aggregate to form macromolecules which are capable of scattering light and producing an opacity with a resulting cataract formation. The major efforts of the sec-

tion are being directed toward this problem.

During his sabbatical year at the Department of Biophysics, Kings College, London and the Marine Laboratory, Plymouth Laboratory, England, Dr. Paul Witkovsky studied the structure and function of the roof nucleus of the selachian brain as part of an overall structural and functional analysis of synaptic pathways in the vertebrate retina.

Dr. Tadasu Tokumaru has been concerned with antiviral agents against ocular infections and with the biologic characterization of herpes simplex virus transformed tissue culture cells. He has studied the effects of prostaglandin inhibitors on herpetic keratouveitis and suggested that although iritis may be suppressed, the corneal lesion continues. The observation that herpes simplex virus transformed from tissue cultures injected into the eye can produce orbital sarcoma has been established but the interpretation is still under assessment.

In the clinical area Dr. Myles M. Behrens has established an active clinical Neuro-Ophthalmology teaching and consulting service at the Neurological Institute.

In the Knapp Memorial Laboratory of Physiological Optics Dr. Charles J. Campbell has been active in fluorescein angiography, fundus photography, and electroretinography as supplements to conventional methods of examination. Investigative evaluation of the vitreous has been initiated. Pathology has been produced in the vitreous in animal models and a number of techniques have been explored to improve evaluation of vitreous *in vivo*.

The reliability of ultrasound in ocular diagnosis has been the prime interest of Dr. D. Jackson Coleman who has developed a laboratory in ocular ultrasound which is second to none. Reliability has been enhanced by the development of new color scanning techniques, the use of M-scan and multi-frequency analysis of physiologic signals.

Dr. Richard W. Darrell has organized an external eye disease clinic working in collaboration with Dr. Tokumaru's laboratory.

During 1972 Dr. Andrew de Roeth, Jr. has made changes in the techniques of cyclocryocautery for glaucoma and believes that a combined thermo and cryocautery may be the best procedure in certain types of intractable glaucoma.

Dr. John W. Espy has continued his studies as an FDA investigator for soft contact lenses, an area at the present which is quite controversial.

In addition to supervising the residency training program and the medical student ophthalmology curriculum, Dr. R. Linsy Farris has been working

with Dr. Manski in studies on corneal transplantation in in-bred rats. He is also investigating changes in corneal thickness in various corneal disease, the corneal effects of soft contact lens wear, and the tear osmolarity in patients with dry eyes.

During the past year in collaboration with Dr. Guillermo Pico, Jr., Dr. Max Forbes has completed a trial of the non-contact tonometer. He has initiated studies of the effect of pilocarpine on anterior chamber depth and angle width in angle-closure glaucoma and has studied acute glaucoma following retinal detachment surgery. With Dr. Coleman he is continuing the study of ultrasonography in management of the flat anterior chamber.

Dr. Frank B. Hoefle has studied the effects of calcium free perfusion on the rabbit corneal endothelium, the effects of eyebank storage on the rabbit endothelium, and the effect of contact lens wear on corneal curvature, disc edema and corneal thickness. A study on the effect of cytochalasin B on corneal endothelium is underway in association with Dr. Fishbarg and Dr. Kaye.

Dr. Francis A. L'Esperance, Jr.'s laser laboratory has been awarded a large grant this year for the investigation of the pathologic hemodynamics of retinal vascular disease. This study encompasses the valuation of blood flow systems in the normal and pathologic choroid and retina by the use of videotaped fundus photography and hemobarometry.

Dr. George R. Merriam, Jr. has remained a member of the Radiobiological Advisory Panel of the Committee on Space Biology & Medicine of the National Academy of Sciences which is studying some of the problems posed by the Apollo flights. He has continued his study of the influence of age on the radiosensitivity of mammalian lenses. To date about 1500 rats have been exposed to single and divided doses of x-ray. He has noted that the relative sensitivity in young and adult lenses is highly dose dependent.

Uveitis and infectious diseases continues to be the greatest area of interest and activity of Dr. Emil Wirostko. In the laboratory, efforts to isolate an infectious agent responsible for uveitis continue. He feels that a laboratory model for this disease is probably feasible. Electronmicrographic studies are currently in progress on human and animal eyes to determine if, indeed, the disease is the same. His work in uveitis suggests that a host of ocular and systemic diseases with chronic inflammation may be caused by viral-like agents.

During the past year Dr. Harold F. Spalter has continued his interest in photocoagulation treatment in the natural history of diabetic retinopathy with

particular emphasis upon the maculopathy of diabetes. With Dr. Jerry C. Jacobs of the Pediatric Department he is continually reviewing individuals with juvenile rheumatoid arthritis for ocular manifestations of this systemic disease.

The Orthoptic Department under the direction of Miss Sally Moore has completed its 23rd year in operation. The school has been approved as a training center to include a basic science course with the training being extended to two years. In addition to supervising a large number of private and clinic patients the department is active in instruction of residents as well as students in the school.

Dr. David H. Abramson, a second year resident, has spent most of his research time on ophthalmic biometric problems using high resolution ultrasound. He has observed the effect of succinylcholine on the anterior chamber and lens thickness in human patients and the effect of pilocarpine on the anterior chamber depth and lens thickness in normal and elderly individuals and has studied the correlation between the histological patterns and ultrasonic characteristics of ocular neoplasms.

Work is proceeding on the renovation of the John M. Wheeler Library. It is hoped that it will be completed this year. When this is done complete facilities for audiovisual instruction will be available for the resident and undergraduate students. It is proposed to integrate this with the new television system which has been installed in our operating room.

As in previous years the members of the clinical and research staff have taken part in lectures, symposia and teaching exercises throughout this country, Indonesia, Australia, South America and Europe.

We acknowledge with extreme gratitude contributions from the following sources: American Optical Corp., Arkwright Mfg. Company, Marie Heye Clemens Fund, Inc., Robert Sterling Clark Foundation, Caleb C. & Julia W. Dula Educational & Charitable Foundation, Fight for Sight, Inc., Mr. and Mrs. Henry J. Gaisman, Hancock Foundation, John A. Hartford Foundation, The Mary W. Harriman Trust, Mr. Henry H. Hoyt, Kerry Foundation, Knights Templar Eye Foundation, National Institute of Health, The National Foundation, National Council to Prevent Blindness, Reader's Digest Association, Research to Prevent Blindness, Inc., Seth Sprague Educational and Charitable Foundation, The Skerryvore Foundation, Inc., M. A. Shapiro Fund, and Mr. DeWitt Wallace.

During 1972 3,720 patients were hospitalized

for 23,840 days, compared to 4,007 patients and 25,897 patient days during 1971. In the Children's

Clinic 1,438 patients were seen in 1972 in comparison to 1,596 in 1971.

1972 Publications

Ophthalmology

Abramson, David H.

Anterior chamber and lens thickness changes induced by succinylcholine. *Arch. Ophthalmol.* **86**:643-747, 1971.

Abramson, David H.; Coleman, D. Jackson;

Forbes, Max and Franzen, Louise A.

Pilocarpine: effect on the anterior chamber and lens thickness. *Arch. Ophthalmol.* **87**:615-620, 1972.

Abramson, David H.; Abramson, Allan L. and Coleman, D. Jackson.

Ultrasonics in otolaryngology: an aid in the diagnosis of middle ear fluid. *Arch. Otolaryngol.* **96**:146-150, 1972.

Bethel, R. A. and Eakins, K. E.

The mechanism of the antagonism of experimentally induced ocular hypertension by polyphlorethin phosphate. *Exp. Eye Res.* **13**:83-91, 1972.

Bito, L. Z.

Accumulation and apparent active transport of prostaglandins by some rabbit tissues 'in vitro' *J. Physiol.* **221**:371-387, 1972.

Bito, L. Z. and Myers, R. E.

On the physiological response of the cerebral cortex to acute stress (reversible) asphyxia. *J. Physiol.* **221**:349-370, 1972.

Bito, L. Z.

Comparative study of concentrative prostaglandin accumulation by various tissues of mammals and marine vertebrates and invertebrates. *Comp. Biochem. Physiol.* **43A**:65-82, 1972.

Brown, Harold W. and Brown, David H.

Ocular toxocariasis. In: *Microbiology of the Eye*, edited by Deborah Locatcher-Khorazo and Beatrice Carrier Seegal. St. Louis, The C. V. Mosby Company, 1972.

Campbell, Charles J. and Rittler, M. Catherine.

Cataract extraction in the retinal detachment-prone patient. *Amer. J. Ophthalmol.* **73**:17-24, 1972.

Color vision in retinal pathology. I. Macular degeneration. In: *Modern Problems in Ophthalmology* **11**:98-105, 1972. *First Symposium of the International Research Group on Colour Vision Deficiencies*, Ghent, 1971. Bascl, S. Karger, 1972.

Cardona, Hernando and Trokel, Stephen L.

Soft vacuum lens for foreign body localization. *Amer. J. Ophthalmol.* **74**:296-298, 1972.

Cardona, H.; Castroviejo, R. and DeVoc, A. G.

Advances in prosthokeratoplasty. In: *Corneal Grafting*, T. A. Casey, ed., Butterworths, London, 1972.

Cardona, H. and Trokel, Stephen L.

A soft lens for foreign body localization. *Trans. Amer. Acad. Ophthalmol. and Otolaryngol.* **76**:521, March-April, 1972.

Coleman, D. Jackson; Jack, Robert L. and Franzen, Louise A.

B-scan ultrasonography of orbital mucocoeles. *Eye, Ear Nose & Throat Monthly* **51**:207-211, 1972.

High resolution B-scan ultrasonography of the orbit. I. The normal orbit. *Arch. Ophthalmol.* **88**:358-367, 1972.

High resolution B-scan ultrasonography of the orbit. II. Hemangiomas of the orbit. *Arch. Ophthalmol.* **88**:368-374, 1972.

High resolution B-scan ultrasonography of the orbit. III. Lymphomas of the orbit. *Arch. Ophthalmol.* **88**:375-379, 1972.

High resolution B-scan ultrasonography of the orbit. IV. Neurogenic tumors of the orbit. *Arch. Ophthalmol.* **88**:380-384, 1972.

Ultrasonography in pediatric ophthalmology. *J. Pediatr. Ophthalmol.* **9**:111-119, 1972.

Coleman, D. Jackson; Jack, Robert L.;

Franzen, Louise A. and Werner, Sidney C.

High resolution B-scan ultrasonography of the orbit. V. Eye changes of Graves' disease. *Arch. Ophthalmol.* **88**:465-471, 1972.

Coleman, D. Jackson; Jack, Robert L.; Jones, Ira Snow and Franzen, Louise A.

High resolution B-scan ultrasonography of the orbit. VI. Pseudotumors of the orbit. *Arch. Ophthalmol.* **88**:472-480, 1972.

Coleman, D. Jackson

A diamond knife for vitreous surgery. *Trans. Amer. Acad. Ophthalmol. & Otolaryngol.* **76**:522-523, March-April, 1972.

Reliability of ocular and orbital diagnosis with B-scan ultrasound. I. Ocular diagnosis. *Amer. J. Ophthalmol.* **73**:501-516, 1972.

Reliability of ocular and orbital diagnosis with B-scan ultrasound. 2. Orbital diagnosis. *Amer. J. Ophthalmol.* **74**:704-718, 1972.

Ultrasound in vitreous surgery. *Trans., American Academy of Ophthalmology and Otolaryngology* **76**:467-479, March-April, 1972.

Coleman, D. Jackson; Jack, Robert L. and

Cardona, Hernando.

Ultrasonic evaluation of eyes with keratoprotheses. *Amer. J. Ophthalmol.* **74**:543-554, 1972.

- Darrell, R. W.
Ocular infections caused by the herpesvirus group. In: *Microbiology of the Eye*, D. Locatcher-Khorazo and B. C. Seegal, eds., St. Louis, The C. V. Mosby Company, 1972.
- Ocular infections caused by the poxvirus, togavirus, myxovirus, paramyxovirus and picornavirus groups. In: *Microbiology of the Eye*, edited by D. Locatcher-Khorazo and B. C. Seegal. St. Louis, The C. V. Mosby Company, 1972.
- Penetrating grafts using herpes convalescent cornea. *Arch. Ophthalmol.* **87**:411-416, 1972.
- Darrell, Richard W. and Vrabec, Frantisek.
Vaccinia virus infection of the rabbit cornea. *Arch. Ophthalmol.* **86**:568-574, 1971.
- DeVoe, Arthur Gerard.
The practical management of ocular infections. Part I—Bacterial infections. *Canad. J. Ophthalmol.* **7**:3-12, 1972.
- The practical management of ocular infections. Part II—Viral infections. *Canad. J. Ophthalmol.* **7**:13-18, 1972.
- A review of the surgical techniques of keratoprostheses. *Surv. of Ophthalmol.* **16**:170-174, 1971.
- Eakins, K. E.; Whitelocke, R. A. F.; Perkins, E. S.; Bennett, A. and Unger, W. G.
Release of prostaglandins in ocular inflammation in the rabbit. *Nature, New Biology* **239**:248-249, 1972.
- Eakins, K. E.; Whitelocke, R. A. F.; Bennett, A. and Martenet, A. C.
Prostaglandin-like activity in ocular inflammation. *Brit. Med. J.* **3**:452-453, 1972.
- Eakins, K. E. and Sanner, J. H.
Prostaglandin antagonists. In: *Prostaglandins Progress in Prostaglandin Research*, edited by S. M. M. Karim. Oxford, Medical and Technical Publishing Company Ltd., 1972.
- Edmonds, Craig and Iwamoto, T.
Electron microscopy of late interstitial keratitis. *Ann. Ophthalmol.* **4**:693-711, 1972.
- Farris, R. Linsy and Donn, Anthony.
Corneal respiration with soft contact lenses. *J. Amer. Optom. Ass.* **43**:292-294, 1972.
- Fischbarg, J.
Ionic permeability changes at the basis of the thermal dependence of the resting potential in barnacle muscle fibers. *J. Physiol. (London)* **244**:149-171, 1972.
- Potential difference and fluid transport across rabbit corneal endothelium. *Biochem. Biophys., Acta* **288**:362-366, 1972.
- Hollyfield, Joe G.
Egg pigment: early elimination from the developing retina of the frog. *Experientia* **28**: 68-69, 1972.
- Histogenesis of the retina in the Killifish, *Fundulus heteroclitus*. *J. Comp. Neurol.* **144**:373-380, 1972.
- Hoyt, W. F.; Rios-Montenegro, E. N.; Behrens, M. M. and Eckelhoff, R. J.
Homonymous hemioptic hypoplasia. *Brit. J. Ophthalmol.* **56**:537-545, 1972.
- Inomata, Hajime; Bill, Anders and Smelser, George K.
Aqueous humor pathways through the trabecular meshwork and into Schlemm's canal in the cynomolgus monkey (*Macaca irus*): an electron microscopic study. *Amer. J. Ophthalmol.* **73**:760-789, 1972.
- Inomata, H.; Smelser, G. K. and Polack, Frank M.
Corneal vascularization in experimental uveitis and graft rejection. *Invest. Ophthalmol.* **10**:840-850, 1972.
- Inomata, Hajime; Bill, Anders and Smelser, George K.
Unconventional routes of aqueous humor outflow in cynomolgus monkey (*Macaca irus*). *Amer. J. Ophthalmol.* **73**:893-907, 1972.
- Iwamoto, Takeo; DeVoe, A. Gerard and Farris, R. Linsy.
Electron microscopy in cases of marginal degeneration of the cornea. *Invest. Ophthalmol.* **11**:24-257, 1972.
- Jack, Robert L. and Coleman, D. Jackson.
B-scan ultrasonographic diagnosis of ocular and orbital disease. *Canad. J. Ophthalmol.* **7**:257-267, 1972.
- Jack, Robert L.
Regression of the hyaloid vascular system. *Amer. J. Ophthalmol.* **74**:261-272, 1972.
- Ultrastructure of the hyaloid vascular system. *Amer. J. Ophthalmol.* **87**:555-567, 1972.
- Ultrastructural aspects of hyaloid vessel development. *Arch. Ophthalmol.* **87**:427-437, 1972.
- Kapany, Narinder S.; Unterleitner, Fred C.; Peabody, Robert R. and L'Esperance, Francis A., Jr.
Green laser photocoagulator using fiber optics. *Arch. Ophthalmol.* **88**:80-84, 1972.
- Kaye, G. I.; Hoefle, F. B. and Sibley, R. C.
Penetration of horseradish peroxidase into the intracellular spaces of rabbit and frog corneal endothelium. *Arch. Mex. de Anat.* **39**:23, 1972.
- Koverman, J. and Hoefle, F.
Corneal edema with small, thin, methy-methacrylate contact lenses; clinical studies. In: *Symposium on the Flexible Lens*, edited by J. Bitonte and R. Keates. St. Louis, The C. V. Mosby Company, 1972.
- L'Esperance, Francis A., Jr.
Clinical photocoagulation with the Krypton laser. *Arch. Ophthalmol.* **87**:693-700, 1972.
- Li, Lu-Ku and Spector, Abraham.
Studies on the reaggregation of isolated subunits of calf lens alpha-crystallin. *Exp. Eye Res.* **13**:110-119, 1972.
- Manski, W.
Immunochemical methods in evolutionary studies. In: *Medical Primatology*, proceedings of the *Second International Conference on Experimental Medicine and Surgery in Primates*, 1969. Basel, S. Karger, 1971.
- Manski, W. and Spector, A.
I. Immunochemical studies on alpha crystallin subunits. *Exp. Eye Res.* **13**:194-204, 1972.

- Merriam, G. R., Jr.; Szechter, A. and Focht, Elizabeth F.
The effects of ionizing radiations on the eye. In: *Frontiers of Radiation Therapy and Oncology* 6:346-385, 1972. Basel, S. Karger.
- Moore, S. and Stockbridge, L.
Diagnostic observation on acquired unilateral and bilateral superior oblique palsies. In: *Orthoptics*, proceedings of the *Second International Orthoptic Congress*, 1969. Amsterdam, Excerpta Medica, 1972.
Fresnel prisms in the management of combined horizontal and vertical strabismus. *Amer. Orthoptic J.* 22:14-21, 1972.
- Mund, Michael I.; Rodrigues, Merlyn M. and Fine, Ben S.
Light and electron microscopic observations of the pigmented layers of the developing human eye. *Amer. J. Ophthalmol.* 73:167-182, 1972.
- Naka, Ken-Ichi and Witkovsky, Paul.
Dogfish ganglion cell discharge resulting from extrinsic polarization of the horizontal cells. *J. Physiol.* 223:449-460, 1972.
- Reese, Algernon B.
Expanding lesions of the orbit (Bowman Lecture). In: *Trans., Ophthalmological Societies of the United Kingdom* 91:85-104, 1971.
- Regan, Ellen F. and Day, Robert M.
Cataract extraction after filtering procedures. *Amer. J. Ophthalmol.* 71:331-333, 1971.
- Rios-Montenegro, E. N.; Behrens, M. M. and Hoyt, W. F.
Pseudoxanthoma elasticum. *Arch. Neurol.* 26:151-155, 1972.
- Scott, Alan B. and Knapp, Philip
Surgical treatment of the superior oblique tendon sheath syndrome. *Arch. Ophthalmol.* 88:282-286, 1972.
- Smelser, G. K. and Ozanics, V.
Development of the cornea. In: *Symposium on the Cornea. Trans., of the New Orleans Academy of Ophthalmology*. St. Louis, The C. V. Mosby Company, 1972.
Reaction of the cornea to injury and wound healing. In: *Symposium on the Cornea. Trans., of the New Orleans Academy of Ophthalmology*. St. Louis, The C. V. Mosby Company, 1972.
- Spalter, Harold F.
An ophthalmologist's view of diabetic retinopathy. *The Sight-Saving Review* 41:167-170, Winter 1971-1972.
Diabetic retinopathy; problems and management. In: *Contemporary Ophthalmology Honoring Sir Stewart Duke-Elder*, John G. Bellows, ed. Baltimore, The Williams and Wilkins Company, 1972.
Photocoagulation of diabetic maculopathy. In: *Modern Problems in Ophthalmology*, Volume 10. Basel, S. Karger, 1972.
- Spector, Abraham.
Aggregation of alpha crystallin and its possible relationship to cataract formation. In: *Proceedings of The Israel Academy of Science and Humanities*, 1972.
- Trokel, Stephen L.; Schlesinger, Edward B. and Beaton, Howard.
Diagnosis of orbital tumors by gamma-ray orbitography. *Amer. J. Ophthalmol.* 74:675-679, 1972.
- Villanueva, R.; Hinds, L.; Katz, R. L. and Eakins, K. E.
The effect of polyphlorethin phosphate on some smooth muscle action of prostaglandins in the cat. *J. Pharmacol. Exp. Therap.* 180:78-85, 1971.
- Wheeler, Maynard C.
Long-term results of the surgical treatment of strabismus. *J. Pediatr. Ophthalmol.* 9:76-78, 1972.
- Witkovsky, P.
The structure of the human eye. In: *Encyclopedia Americana* 10:809-814, 1972.
- Wulle, K. G.
The development of the productive and draining system of the aqueous humor in the human eye. In: *Advances in Ophthalmology* 26:296-355, 1972. Basel, S. Karger.
- York, A. T.; Hamada, S. and Manski, W.
Immunochemical studies on crystallins and albuminoids in galactose cataracts of inbred rats. *Ophthalm. Res.* 2:273-284, 1971.
- York, A. T.; Martinez, C. and Manski, W.
Immunochemical studies on crystallins and albuminoids in human senile cataracts. *Ophthalm. Res.* 3:183-191, 1972.
- Zouzas, D. and Manski, W.
II. Immunochemical studies on alpha crystallin subunits. *Exp. Eye Res.* 13:205-218, 1972.

Orthopaedic Surgery

FRANK E. STINCHFIELD

Professor and Chairman of the Department • Director of Service

During the past year Dr. Robert S. Mathews joined our staff as Assistant Attending Orthopaedic Surgeon and Assistant Professor of Clinical Orthopaedic Surgery and Pathology. Drs. Robert E. Carroll and Alexander Garcia were promoted from Associate Professor of Clinical Orthopaedic Surgery to Professor. Dr. Marvin L. Shelton was promoted from Assistant to Associate Professor of Clinical Orthopaedic Surgery; Dr. Nasseroddin S. Eftekhar from Instructor to Assistant Professor of Clinical Orthopaedic Surgery and Dr. Rosamond Kane from Instructor to Assistant Clinical Professor of Surgery.

Following affiliation of the College of Physicians and Surgeons with St. Luke's Hospital, a portion of the teaching of second year orthopaedic surgery has been conducted at St. Luke's Hospital under the able direction of Dr. J. William Fielding and staff.

Our fourth year elective program has continued to expand, offering exposure to clinical and operative orthopaedic surgery, to research in musculoskeletal trauma, to anatomy and to surgical trauma at the Medical Center and St. Luke's and Roosevelt Hospitals.

Dr. C. Andrew L. Bassett and staff have continued their work in basic and clinical research in the Orthopaedic Laboratories.

During the year, three students participated in the research programs during their elective periods under the supervision of Drs. Rice, Johnston and Bassett in the EM Laboratory, learning the technical aspects of this discipline and defining specific pathology or research problems. Dr. Anthony Cabot spent two months in the laboratories during which time he

was able to delineate the ultrastructural characteristics of Ewing's sarcoma, reticulum cell sarcoma, and other round cell tumors of bone. In fact, new structural aspects of the cells and their extracellular matrix in these pathological entities were found, so that a more precise diagnosis now can be accomplished with the aid of electronmicroscopy. The results of these studies have been submitted for publication.

Mr. D. N. Tornberg and Mr. H. J. Robinson, fourth-year students, have produced some fine research work in both ultrastructure of chondromyxoid fibroma and studying the effects of a potent osteogenic factor on periosteal bone.

The National Institutes of Health Orthopaedic Research Training Grant continues to support selected residents and Ph.D.s in our laboratory program. During the year, Dr. John Bargren, working with Drs. Bassett and Gjelsvik and Mr. Pawluk, was successful in defining the electromechanical behavior of highly oriented cortical bone samples during cyclic compression and tensile loading.

Mrs. Gloria Reinisch, currently in her final year of candidacy for a Ph.D. in bioengineering, continues to carry out joint studies with the Orthopaedic Research Laboratories and the School of Engineering under the supervision of Professor Norwick of the School of Engineering and Dr. Bassett.

A reorganization of the Orthopaedic Research Laboratories has been completed, which considerably strengthens both the teaching and research programs. Whereas, several diverse programs of

investigation have been in progress for the past years in the laboratories, now these programs have been centered on the bio- and cellular engineering problems. A unified, multidisciplinary approach has evolved.

As a result of the necessity for increased communication between laboratory members and in order to discharge the research training mission of the laboratories, a conference room and working research library have been added to the facilities this year. Renovations for this important project were made possible through a generous grant from The New York Orthopaedic Hospital Alumni Association and private contributors through the Chairman of the Department.

The laboratories facilities also have served as a base for several collaborative effects with investigators from the clinical service. Drs. Austin D. Johnston and Robert S. Mathews have provided strong leadership in utilizing the EM facilities to conduct ultrastructural studies on some of the wealth of pathological material available from the clinical service. Dr. N. S. Eftekhar has been intimately involved in biomechanical investigation of articular replacement materials and designs, particularly for the knee. After 15 years of investigation of electrical control mechanisms in the musculoskeletal system, a practical method has been developed to improve osseous repair and has been applied in the human with success.

Dr. Robert E. Carroll has continued to be extremely active as chief of the hand service. He presented numerous papers at various institutions throughout the United States and Canada and served as Visiting Professor at the University of Toronto. He was elected vice president of the New York Hand Society and served on the Executive Committee of the Association of Bone and Joint Surgeons. He has continued his work on construction of functioning hand elements in children born without most of the hand.

Dr. Harold M. Dick has continued his interest in hand surgery and tumors and served as Visiting Professor and Lecturer at the Princess Margaret Hospital in Nassau, Bahamas. He has continued to serve as secretary and treasurer of The New York Orthopaedic Hospital Alumni Association.

Dr. Eftekhar has continued his interest in total hip and knee devices and various related subjects. He was elected to membership in the American Academy of Orthopaedic Surgeons.

Dr. Alexander Garcia has remained active on many committees, including the University Senate and has continued his interests at both the under-

and post-graduate teaching levels. He has been elected as secretary of the Medical Board of The Presbyterian Hospital and was appointed as Chairman of the Site Committee, the Association of Bone and Joint Surgeons. He is conducting a study on vertebral instability in conjunction with Drs. Edgar M. Housepian and Austin D. Johnston.

Dr. S. Ashby Grantham has continued studies on various subjects including childhood elecranon fractures, results and techniques of a vertebral biopsy, further development of femoral supracondylar plate and a computer study of recurrent dislocation of the patella. Dr. Grantham was appointed Consultant in Orthopaedic Surgery at the United States Naval Hospital, Chairman of the Trauma Section ad hoc committee on Self-Assessment Examination, American Academy of Orthopaedic Surgeons and as an examiner for The American Board of Orthopaedic Surgery.

Dr. Johnston continued to be interested in electronmicroscopy of bone tumors including Ewing's sarcoma, chondromyxoid fibroma and chondrosarcoma. Dr. Johnston, with Dr. F. Feldman (Radiology) presented an exhibit on roentgenologic signs with intraosseous ganglion at the New York Roentgenologic Society meeting in New York and at the American Roentgenologic Society meeting in Washington for which they received a Certificate of Merit Award.

Dr. Rosamond Kane continued to ably contribute to our Children's Foot Clinic and has continued her studies of club foot and related problems in children.

Dr. Hugo A. Keim continued his active interest in the field of scoliosis, conducting studies on the use of the Moires screen in determining scoliosis curves. He is actively interested in the electrical production and correction of scoliosis curves in dogs. Dr. Keim again conducted a three day course on the management and care of the scoliosis patient sponsored by the American Academy of Orthopaedic Surgeons.

Dr. Mathews spent the first six months of the year at Oxford University with Professor Robert Duthie, in the Nuffield Department of Orthopaedic Surgery. He is continuing his studies on normal bone periosteum and its fracture healing response. One of his research projects is on the granular content of certain reticuloendothelial cells under various pathological conditions involving synovium.

Dr. Charles S. Neer II has projected his interest in trauma and in affections of the shoulder, presenting a number of papers at various meetings and participating in various instructional courses. He

served as Visiting Professor at Harvard University and the University of Minnesota, as First Raney Visiting Professor, Alumnae of the University of North Carolina and as Guest Lecturer at various hospitals and orthopaedic societies. He has been appointed to various committees of the American Academy of Orthopaedic Surgeons, The American Orthopaedic Association, the American Trauma Society and The American Board of Orthopaedic Surgery, Inc., including chairmanship of the 1973 National Residents Conference. He was appointed an honorary member of the Virginia Orthopaedic Society.

Dr. Frank E. Stinchfield was elected President of the Medical Board of The Presbyterian Hospital.

Our residents continue to be active in many varied research projects, presenting papers at various meetings.

Acknowledgments

The New York Orthopaedic Hospital is deeply appreciative of the continued active support of our Women's Auxiliary and of our many friends, including Mr. Malcolm P. Aldrich, Mrs. Edward J. Birmingham, Mrs. H. Lawrence Bogert, Dr. Harry N. Boltin, Dr. Robert E. Carroll, Church & Dwight, Mrs. Irving J. Feldman, Dr. and Mrs. Jacob Feldman, Dr. and Mrs. James D. Gallagher, Mrs. Mary Hall, Mrs. Halford Hallock, Mr. Harry P. Hertz, Mr. and Mrs. H. H. Hoyt, Mr. and Mrs. William G. Humphrey, Miss Marion C. Kenton, Dr. S. M. Luchs, Mr. Herman J. McCarthy, Mrs. William G. Maguire, Mr. and Mrs. George Miller, Mr. Charles S. Munson, Jr., Mr. Philip D. Reed, Dr. and Mrs. William H. Shehadi, Mrs. DeWitt Wallace, Dr. Edward M. Wheller, Mr. Frank E. Zorniger, The Chace Foundation, Community Funds, Inc., Deering Milliken Foundation, The Electric Storage Battery Co., Inc., J M Foundation, The Health Research Council of the City of New York, Johnson & Johnson, Merck Sharp & Dohme, The National Institutes of Health, The National Dental Research Institute, The National Institute of Arthritis and Metabolic Diseases, Philip D. Reed Foundation, Inc., Polachek (John) Foundation Grant, Proctor & Gamble, Mr. William R. Salomon, Estate of John Sloane, Mr. Joseph A. Thomas, Williams-Adler Foundation and The United States Army Research and Development Command.

Harlem Hospital Center

Inpatient Facilities

During the past year the Orthopaedic Service continued to operate with a permanent allocation of 55

adult and 15 pediatric and adolescent beds in the Martin Luther King Pavilion. The bed occupancy was over 10% until the final three months when there was a decrease in the number of emergency admissions. Six hundred and eighty patients were admitted of which 150 were pediatric admissions. For the most part, all emergencies presenting were admitted here for treatment. There appears to have been some adjustment in the admitting policy of neighboring hospitals which has resulted in their receiving a larger proportion of accidents which heretofore were funneled into the Harlem Emergency room. There also appears to be an improved disposition mechanism here which decreased the number of patients hospitalized for long periods after resolution of their medical problems.

Operative Procedures

Five hundred and eighty-eight major operative procedures were performed during the year. The majority of these were done by elective rather than by emergency scheduling. This considerable improvement was brought about by the opening up of additional operating rooms. Requests were successful in petitioning the Surgical Service to allocate three operating rooms on the main operating day which is Thursday and an additional room all day on Monday and Friday.

Outpatient Clinics

The outpatient clinic visits have stabilized at approximately 8,000 per year. Approximately one-quarter of these were pediatric. It was felt that this represented an adequate pool of teaching material for our orthopaedic staff. The major problems in the outpatient area are the presence of outmoded facilities; namely, too small an area for the number of doctors and patients in any particular clinic, the absence of an adequate area for application and removal of plasters. The availability of critical x-rays, particularly the post-injury and early treatment films when the patient returned for follow-up care is a continuing problem.

Two Fracture Clinics, one Pediatric Clinic, one Adult Orthopaedic Clinic and one Hand Clinic operate each week. In addition, there is a monthly combined Crippled Children's Clinic and an Amputee Clinic which is supported in conjunction with the Pediatric and Rehabilitation Medicine Services.

Personnel

The professional staff consists of Drs. Marvin L. Shelton, Chief; Caleb Medley, Assistant Chief; Aaron Gold, Associate; John L. Xethalis, Kumar Reddy, Paul Ort and Harold M. Dick, Assistant

Visiting Surgeons and S. Ashby Grantham, Consultant.

Dr. Ort, the newest member of our staff, successfully passed his Board of Orthopaedic Surgery examinations in September. Dr. Medley plans to take his certifying boards next year. Dr. Cecil Phillips submitted his resignation.

Staff Personnel consists of Norbert Simmons, R. N., Operating Room Nurse Specialist; Edna F. Onley, R. N., Orthopaedic Pediatric Nurse Specialist; and Dennis G. Rivera, Orthopaedic Assistant. Mr. Simmons and Mrs. Onley continue to perform outstanding services in their respective areas. Mr. Rivera, unfortunately for us, has entered the Physicians Assistants Training Program at Harlem Hospital Center, and will be unavailable to our program for approximately two years.

Residency Training Program

Currently six residents are assigned to our program — Drs. S. Chae Choi, C. Moultrie, R. Singh, C. Henry, G. Gill, and A. Gray. In addition there are two fellows, Drs. P. Cabalero and B. Dalavagas. Dr. Cabalero has passed his boards and is awaiting State licensure before applying for an attending position. His excellent contribution is on the children's service. Dr. Dalavagas, who trained at New York University, and practiced for several years in Greece, is in the process of obtaining State licensure and applying for Orthopaedic Boards. His work is of the highest quality. The residency program is in a position to accept only the average or better United States trained physicians or outstanding foreign trained physicians. It is the hope of the Orthopaedic Department at Harlem Hospital Center that the residents at this institution have a reciprocal rotation with the residents at The New York Orthopaedic Hospital. It is planned to petition the Residency Review Committee of the AMA to increase the number of residencies from two to three each year. This would allow the program to continue its patient care responsibilities and further decrease the number of residents we require from surgical service. Surgery is experiencing difficulty in furnishing the Orthopaedic Department with enough residents (three) to man our service.

The service has continued to benefit from the rotation of second year residents from The New York Orthopaedic Hospital for a six week period of fracture training. These residents without exception have been enthusiastic and seemed to thoroughly enjoy their experience as much as our staff has enjoyed having them.

Consultation

Dr. Grantham has continued to serve devotedly. Each year his presence on Harlem Hospital Center Staff becomes more valuable and greatly improves the quality of the teaching. Dr. Johnston continues to serve as consultant. He has suggested that a resident rotate through his laboratory for indepth training in orthopaedic pathology. This is an excellent idea which is heartily endorsed.

Research Projects

Continuing studies of methods to influence fracture healing, particularly in the femur and tibia are being carried out. An elaborate device to alternately compress and distract tibial fractures has been developed to improve fracture healing. A protocol utilizing periodic isotope scanning to measure the rate of bone formation at the fracture site is being used.

A clinical study of the incidence of non-union in fractures of the tibial shaft with an intact fibula is being reviewed.

Trauma Registry

The Orthopaedic Service has established a trauma registry for musculo-skeletal injuries. This has been included in a proposal comprehensive from Harlem Hospital to the Johnson Foundation for Funding. It is hoped that this will allow us to generate valuable statistics about the overall problems of the trauma victim and might provide us with improved abilities for record keeping and additional personnel which will aid in the day to day operation.

The New York State Rehabilitation and Research Hospital

During 1972, legislation was passed, changing the name of the hospital to the New York State Rehabilitation and Research Hospital and designating the hospital as a regional center to permit admission of out-of-state patients who fall within certain disability or disease categories (Northern New Jersey, Southern Connecticut and Southern Massachusetts). Funds were made available for planning a new hospital. Planning conferences were held and an architectural firm has been selected. Ground-breaking for this new 250-bed hospital is slated for 1973 with completion scheduled in five years.

Dr. Alice L. Garrett was appointed Medical Director, in addition to her position as Director of Surgical Services. Dr. Robert L. S. Boothe was elected to the attending staff as assistant to Dr. Garrett. Two residents from Columbia-Presbyterian Medical Center and one from Harlem Hospital

Center are involved in the orthopaedic program. Operative procedures average twenty per month. This number is expected to increase with the addition of another operating room. Reconstruction of the operating room suite began in October and is scheduled for completion in June 1973, providing the second operating room and an eight-bed intensive care unit.

Dr. Garrett was project director of a seminar on the role of the orthopaedist in the treatment of juvenile rheumatoid arthritis, co-sponsored by the American Academy of Orthopaedic Surgeons and Columbia University, under a grant received from Maternal and Child Health Services of the Department of Health, Education and Welfare. Participants were selected from the fields of orthopaedics, pediatrics, physical medicine, rheumatology, radiology and psychiatry. She was a participant in a conference on the child with an orthopaedic disability — his orthotic needs and how to meet them. This conference was co-sponsored by Maternal and Child Health Services of H.E.W. and the Department of Orthopaedics at Howard University with the Committee on Prosthetics Research and Development of the National Research Council. Dr. Garrett was appointed chairman of the education committee of the American Orthopaedic Foot Society. She was also nominated to membership in the American Congress of Rehabilitation Medicine. Dr. Garrett and staff participated in various seminars and exhibits and presented a number of papers

at various meetings during the year.

The forty-sixth annual meeting of the Alumni Association of The New York Orthopaedic Hospital held on April 14 and 15 was attended by one hundred members. Dr. Charles F. Gregory, First W. B. Carroll Scottish Rite Professor of Orthopaedic Surgery at Texas Southwestern Medical School, acting as Visiting Professor that week, presented the sixteenth annual Alan DeForest Smith Lecture on Orthopaedic Education, Past, Present and Future.

The 1972 British Traveling Fellows, sponsored by the American Orthopaedic Association, participated with our staff in a one-day meeting held during May.

During 1972 3,366 patients were admitted and 2,688 operative procedures were carried out.

<i>Classification</i>	<i>Number of Procedures</i>
Back	138
Upper Extremity	925
Lower Extremity	691
Hip	657
Knee	261
Miscellaneous	16

During the past year, there were 34,117 clinic visits and 1,582 patients returned to our follow-up clinic.

During 1972, routine diagnostic service was accorded 2,083 patients and 438 consultations were carried out in our orthopaedic pathology laboratory.

1972 Publications

Orthopaedic Surgery

Bargren, J. H.; Tilson, D. H. Jr. and Bridgeford, O. E.
Prevention of displaced fatigue fractures of the femur.
J. Bone & Joint Surg. 53-A:115, 1971.

Bassett, C. A. L.
Clinical implications of cell function in bone grafting.
Clin. Orthop. 87:49-59, 1972.

Bassett, C. A. L. and Pawluk, R. J.
Stress potentials in cartilage. *J. Bone & Joint Surg.* 54-A: 1131, 1972 (abstract).
The electrical behavior of cartilage during loading.
Science 178:602, 1972.

Bowers, W. H. and Preston, E.
Low velocity bullet wounds. *Contemporary Surg.* Vol. 1, #5:57, Sept./Oct. 1972.

Bradford, D. S. and Clark, I.
Transfer ribonucleic acid methylases of bone: studies in vitamin A & D deficiency. *Biochem. J.* 126:1057-1066, 1972.

Bray, R. C. and Clark, I.

Vagaries in the use of isolated intestinal mucosal cell preparations with particular emphasis on calcium uptake. In: *Cellular Mechanics for Calcium Transfer and Hemostasis*. Nichols, G., Jr. and Wasserman, R. H., eds., Academic Press, 313-337, 1971.

Carroll, R. E. and Green, D. P.

The significance of the palmar cutaneous nerve at the wrist. *Clin. Orthop.* 83:24-28, 1972.

Carroll, R. E. and Berman, A. T.

Glomus tumors of the hand. *J. Bone & Joint Surg.* 54-A:691-703, 1972.

Clark, I. and Rivero-Cordero, F.

The role of the parathyroid gland in phosphate induced nephrocalcinosis. *Proc. Soc. Exp. Bio. & Med.* 139:805, 1972.

Cochran, G. V. B.

Experimental ideas for stimulating fracture healing. *Bul. N. Y. Acad. Med.* 48:899-911, 1972.

- Cochran, G. V. B.
Implantation of strain gages on bone *in vivo*. *J. of Biomechanics* 5:119-123, 1972.
Use of magnetostrictive transducers for stress measurements within methylmethacrylate "bone cement". *J. Biomed. Mater. Res.* 6:283-285, 1972.
- Eftekhar, N. S.
Operating room design, ventilation, clothing as factors in infection control. *Topics* February 1972.
- Eftekhar, N. S.; Smith, D. M.; Henry, J. H. and Stinchfield, F. E.
Revision arthroplasty using Charnley low friction arthroplasty technique. *Proceeding J. Bone & Joint Surg.* 54-A, 6:1357, Sept. 1972.
- Feldman, F.; Auerback, R. and Johnston, A. D.
Tuberculous dactylitis in the adult. *Am. J. of Roentgenology, Radium Therapy and Nuclear Med.* Vol. CXII, No. 3, 1971.
- Feldman, F. and Johnston, A. D.
Juxta-articular ganglion. *Am. J. of Roentgenology, Radium Therapy and Nuclear Med.* Nov. 1972.
- Garcia, A. and Rothermel, J. E.
Treatment of hip fractures in patients with Parkinson's syndrome on Levodopa therapy. *J. Bone & Joint Surg.* 1251, September 1972.
- Gaston, S. R.
Contributor, *Early Care of the Injured Patient*, Committee on Trauma American College of Surgeons, W. B. Saunders Co., Philadelphia, Pa., August 1972.
- Gopal-Krishnan, S. and Shelton, M. L.
Posterior dislocation of the shoulder: its diagnosis and treatment. *J. National M. A.* 64:106, March 1972.
Bilateral reverse epiphyseolysis proximal femoral capital epiphysis. *J. National M. A.* 64:437, September 1972.
- Hilal, S. K. and Keim, H. A.
Selective spinal angiography in adolescent scoliosis. *Radiology* 102:349-359, February 1972.
- Keim, H. A.
Spine stabilization following trauma. *Clin. Orthop.* 81:53-56, November-December 1971.
Renal failure after knee-chest surgery position. *Modern Medicine* 84, January 10, 1972.
Basic principles of scoliosis. *Third Postgraduate Course in the Management and Care of the Scoliosis Patient*. Zimmer, Warsaw, Indiana p. 1-7, February 1972.
Scoliosis. *CIBA — Clinical Symposia* 24:#1, p. 1-32, April 1972.
- Keim, H. A. and Hilal, S. K.
Complications of surgery for scoliosis — role of blood vessels. Braces today. *The Pope Foundation*, Kankakee, Illinois January 1972.
- Keim, H. A. and Levine, D.
Early detection and treatment of scoliosis. Movie, *The Network for Continuing Medical Education*, January 1972.
- Keim, H. A. and Waugh, T. R.
The surcingle cast in scoliosis treatment. *Clin. Orthop.* 86:154-158, July-August 1972.
- Kennedy, W. R.; Becker, A. and Johnston, A. D.
Massive osteolysis in rheumatoid arthritis. *Clin. Orthop.* 1972.
- Ketenjian, A. Y. and Shelton, M. L.
Primary internal fixation of open fractures: A retrospective study of the use of metallic internal fixation in fresh open fractures. *Trauma*, 12:756, September 1972.
- McCollum, D. E.; Mathews, R. S.; O'Neil, M. T. and Pickett, P. T.
Chapter IX. Gout, Hyperuricemia and aseptic necrosis of the femoral head. In: *Idiopathic Ischemic Necrosis of the Femoral Head in Adults*, eds., W. M. Zin, Thieme Edition, George Thieme Verlag, Stuttgart 1971.
- Mathews, R. S.
Bone formation and the response of bone to implant insertion. *J. Biomedical Materials Research* No. 2 (Part 1) 21-40, February 1972.
- Mathews, R. S. and Woods, C. G.
The femoral neck in osteoarthritis orthopaedics. *Oxford*, Vol. 5 1:25-42, 1972.
- Murray, J. W. G. and Stinchfield, F. E.
Diaphyseal fractures of both radius & ulna in adults. *Orthopaedic Review*, Vol. 1, No. 2, August 1972.
- Neer, C. S.
Contributor, *Emergency Care and Transportation of the Sick and Injured*, American Academy of Orthopaedic Surgeons, George Banta Co., Inc., Menasha, Wisconsin, 1971.
Anterior acromioplasty for chronic impingement syndromes. A Preliminary Report. *J. Bone & Joint Surg.* Vol. 53-A, No. 8:1652-1653, December 1971.
Anterior acromioplasty for impingement syndromes of the shoulder. *J. Bone & Joint Surg.* 54-A, No. 1, January 1972.
- Shelton, M. L.; Neer, C. S. and Grantham, S. A.
Occult knee ligament ruptures associated with fractures. *J. Trauma*, Vol. 11, 10:853-856, October 1971.
- Stinchfield, F. E.; White, E. S.; Eftekhar, N. S. and Kurokawa, K. M.
Low friction arthroplasty. *Surg., Gyn. & Obst.* 135:1-10, July 1972.

Otolaryngology

DANIEL C. BAKER, JR.

Professor and Chairman of the Department • Director of Service

The Department of Otolaryngology is pleased with the physical changes that have developed in the past year. The Bronchoscopic Clinic has been completely renovated and new equipment of the latest type has been procured. Arrangements are in process for the Clinic to be used by the Thoracic Surgery Service as well as the Department of Otolaryngology. The Bronchoscopic Clinic is uniquely situated on the 11th floor between the Babies Hospital and the Presbyterian Hospital. There is easy access to Harkness Pavilion as well as to all floors in Presbyterian Hospital. The renovated clinic is on a par with the clinics in the best institutions in the country.

The new Ear, Nose and Throat Out-Patient Clinic on the 10th floor of Vanderbilt Clinic will be opened around the first of January, 1973. It will include soundproof rooms for audiology and special rooms for speech therapy. There will be ten ear, nose and throat examination rooms as well as an all purpose room for minor surgery. The Clinic will be completely air conditioned. Dr. Robert M. Hui, the Chief of the E.N.T. Clinic with the help of Dr. Joseph Snyder, who is in charge of all Vanderbilt Clinic, have been working on an appointment system for patients and doctors. It is hoped that this will be in effect when the clinic opens.

Dr. Thomas H. Fay has had the opportunity to develop the Audiology and Speech Clinic bringing it into competition with other well known Speech and Hearing Centers. Dr. Fay has participated in the teaching of undergraduate students. He has also introduced special training for residents in oto-

laryngology in the field of audiology and speech.

The department has found it difficult to recruit new personnel. A great effort is being made to entice younger specialists in the field to accept positions on the staff.

The teaching of undergraduate students continues to be the most important function of the department. The section classes are larger and the exposure shorter but every effort is made to acquaint the student with physical diagnosis and the recognition and treatment of ear, nose and throat disease. The department has again taken part in the gross anatomy course for first year medical students. Members of the department are assigned to all the anatomical periods that deal with the anatomy of the head and neck. Members of the department have helped with the Correlation Clinic.

The basic science courses offered to the residents in otolaryngology at Presbyterian Hospital, St. Luke's Hospital and Roosevelt Hospital were given during the summer months on a full-time basis. This year residents from Mt. Sinai Hospital also received instruction in the basic sciences.

Dr. Daniel C. Baker, Jr. has continued as a director of the American Board of Otolaryngology. He is also on the Council of the American Triological Society. He is a member of the Graduate Education Committee of the American College of Surgeons.

Dr. Milos Basek has continued with his research on Meniere's Disease.

Dr. John Conley is very active in the field of head

and neck surgery and reconstructive surgery. He gave lectures at the USAF Medical Center, Lackland Air Force Base and also the Brooke General Hospital. He received the Philip Hench Award at Mercy Hospital, Pittsburgh, Pa. He entertained a team of professors from Bordeaux, France with lectures and operative demonstrations of tumors of the head and neck. He is the Chairman of a combined Head and Neck Training Committee of the American Academy of Ophthalmology and Otolaryngology. He gave the Cardinal Spellman Memorial Lecture at St. Vincent's Hospital and Medical Center in New York City.

Dr. Thomas H. Fay attended and took an active part in the First International Conference on Noise Control Engineering in Washington, D.C.

Mrs. Richard L. Masland has conducted an early language project under the auspices of the Department of Neurology and the Speech Pathology and Audiology Department of Teacher's College.

Dr. Robin Rankow served as Vice-President of the American Society of Maxillofacial Surgeons. He gave the Carl Waldron Honorary Lecture on "Surgical Decision in the Management of Salivary Gland Tumors" at the conjoined meeting of the American Society of Plastic Reconstructive Surgery and the American Society of Maxillofacial Surgeons. Dr. Rankow served as Visiting Professor at the University of Salamanca School of Medicine in May 1972. He was elected as Associate Member of the American Society of Plastic and Reconstructive Surgery and a Fellow of the American Academy of Facial Plastic and Reconstructive Surgery.

Dr. Lawrence Savetsky is a member of the Respiratory Care Unit in Babies Hospital. He is also the supervisor of the pediatric endoscopy service

and pediatric upper airway problems Committee representing the Department of Otolaryngology.

Dr. Juergen Tonndorf took part in a symposium on basic mechanisms in hearing at the Royal Academy of Science in Stockholm, Sweden. Dr. Tonndorf also was a participant at a symposium before the Leopoldina Academy in Halle, Germany. He is a member of the NINDS Communicative Disorders Program Project Review and the National Academy of Science/National Research Council and the Committee on Hearing and Bio-acoustics (CHABA).

Dr. Jules G. Waltner has continued with his work on the histopathology of the temporal bone. He is in charge of the Temporal Bone Laboratory. In the summer of 1972 he was invited to demonstrate his cartilage bar tympanoplasty operation at the Universities of Florence and Bologna, Italy. He delivered a paper on this subject to the International College of Surgeons at Lake George, New York.

Residents in otolaryngology have played an important role in contributing to the ear, nose and throat literature.

The department has received financial support from the Montargent Foundation, the Allen Foundation, Walter Simson, The American Otological Society, The Deafness Research Foundation, and the National Institute of Neurological Diseases and Stroke.

In the Department of Otolaryngology there were 1,912 admissions to Presbyterian Hospital, 580 admissions to Babies Hospital, 16,952 visits to the Vanderbilt Clinic, 513 consultations, 1,200 operations in Presbyterian Hospital and 516 operations in Babies Hospital.

1972 Publications

Otolaryngology

- Baker, Daniel C. Jr. and Karlan, Marc S.
Laryngolith. *Trans. Am. Broncho-Esophag. Assn.* 145-148, 1972.
- Baker, Daniel C. Jr. and Savetsky, Lawrence
Decannulation problems in infants. *Ann. Otol. Rhino & Laryng.* 81:555-557, 1972.
- Baker, Daniel C. Jr. and Hui, Robert M.
Tumors and cysts of the larynx. In *Pediatric Otolaryngology-Disorders of the Respiratory Tract in Children*. Vol. 2. C. F. Ferguson and E. L. Kendig, ed. W. B. Saunders, Phila. 1972.
- Conley, John; Myers, E and Cole, R.
Analysis of 115 patients with tumors of the submandibular gland. *Ann. Otol. Rhino. & Laryng.* 81:323-330, 1972.
- Conley, John
The medical legal problem. *Trans. Am. Acad. Ophth. & Otolaryng.* 76:718-720, 1972.
Use of composite flaps containing bone for major repairs in the head and neck. *Plastic & Reconstructive J.* 49:522-526, 1972.
Use of regional flaps in major head and neck surgery. *J. Otolaryng. Soc. of Australia* 3:303-306, 1972.
Neurogenic tumors of the head and neck. *J. Otolaryng. Soc. of Australia* 3:362-368, 1972.
Regional bone muscle skin pedical flaps in surgery of the head and neck. *Tr. Am. Ac. Ophth. & Otol.* 76:983-997, 1972.
- Eberle, Robert
Facial reanimation in facial paralysis. *Otolaryngologic Clinics of North America* 5:631-638, 1972.
- Fay, Thomas H.; Hochberg, I.; et al.
Audiologic and otologic screening of disadvantaged children. In: *Otitis Media*. A Glorig and K. S. Gerwin, ed. C. C. Thomas, Springfield, Ill. 1972.
- Karlan, Marc S. and Baker, D. C. Jr.
Cervical lymphadenopathy secondary to toxoplasmosis. *Laryngoscope.* 82:956-964, 1972.
- Karlan, Marc S.; Tonndorf, Juergen and Khanna, S. M.
Dual origin of cochlear microphonics: inner and outer hair cells. *Ann. Otol. Rhino. & Laryng.* 81:696-704, 1972.
- Khanna, S. M. and Tonndorf, J.
Tympanic membrane vibrations in cats studied by time-averaged holography. *J. Acoust. Soc. Am.* 51: 1904-1920, 1972.
- Rankow, Robin M.
Ankylosis of the mandible: Effects on growth and development. In: *Plastic and Reconstructive Surgery of the Face and Neck*, Vol. II J. Conley and J. T. Dickinson, eds. Grune & Stratton, Georg Verlag, 1972.
- Tonndorf, Juergen
Physics of sound. In: *Otolaryngology*, Vol I. M. M. Paparella and D. Shumrick, ed. W. B. Saunders, Phila. 1972.
Bone conduction. In: *Foundations of Modern Auditory Theory*. Vol. II. J. V. Tobias, ed. Academic Press, New York. 1972.
- Tonndorf, Juergen and Khanna, S. M.
Tympanic membrane vibrations in human cadaver ears studied by time-averaged holography. *J. Acoust. Soc. Am.* 52:1221-1233, 1972.
- Tonndorf, J.; Khanna, S. M. and Greenfield, E. C.
Total myringoplasty: Functional aspects. *Acta Otolaryngologica* 73:83-93, 1972.
- Tonndorf, Juergen
Invited discussion to session I. In: *Workshop on Physiology of the Auditory System*. M. B. Sachs, ed. National Educational Consultants, Inc. Baltimore, 1972.

Pathology

DONALD W. KING

Delafield Professor and Chairman of the Department • Director of Service

Arden House, September 29 through October 1, was devoted to science and music. Guest speakers included Drs. Juergen Tonndorf, Shyman Khanna (Otolaryngology) and Harry Levitt of CCNY who discussed the anatomy and physics of sound. Other speakers included Dr. Michael Hammond, Professor of Music at the State University, Purchase, N. Y., Robert Mann and Beveridge Webster of the Juilliard School of Music faculty, and Dr. Lubert Stryer, Department of Molecular Biology, Yale. In addition, the Riverside Chamber Ensemble and Concord String Quartet were guests and performed at several sessions.

The History of Pathology Seminars continued with lectures on tracing ancient Egyptian medicine, Dr. John M. Budinger; cholera epidemic—New York City 1832, Dr. Howard Goldstein; Dr. William Harvey and Circulation," Dr. Dickinson Richards: acupuncture, Dr. Frederick Kao (Downstate Medical Center; A Tale of Days and Men, Edinburgh 1726-1966," Dr. Whitley Branwood; a talk on the Castrati by Dr. Meyer Melicow and a lecture on thermal injury and burn care by Dr. Angus Sampath.

Research

In collaboration with Dr. Ruth H. Vogel, Dr. William L. McLellan, Dr. George J. Knight, Dr. Curtis J. Suerth, and Dr. Wiebke H. de Beato, Dr. Henry Vogel continued research on enzyme repression in the arginine biosynthetic system. In *Escherichia coli*, transcriptional as well as trans-

lational components of repression were discovered, and it was shown that either type of component can be altered in regulatory-gene mutants. They found an extreme case of nonuniformity in the regions involved. It was also shown that citrulline either represses or fails to repress arginine enzymes, as a function of metabolic conditions. An unexpected instance of an antagonism of the uptake of α -N-acetylarginine via acetylornithine permease was analyzed.

Dr. Gabriel C. Godman and Mr. Stanley Sawicki investigated the cellular mechanisms of cytotoxicity, resistance and recovery from injury of actinomycin and some of the carcinocidal anthracyclines. The patterns of lethal cell damage, sublethal, reproductive and postmitotic injury, transformation and recovery have each been found to be characteristic of particular cell lines, after equivalent suppression of transcription by these agents. In cells relatively resistant to acute, delayed, or reproductive injury (e.g. Vero), elimination of drug was not a sufficient condition for restoration of RNA synthesis or cell division.

Drs. Godman and Arline D. Deitch, and Mr. Armand Miranda, with the collaboration of Dr. Stuart W. Tanenbaum (Microbiology) have shown that the fungal metabolite cytochalasin D induces reversible contracture of cell cytoplasm, markedly increased contractility of myotubes in culture, striking protrusion and subsequent confluence of zotic processes, and large accumulations of microfilamentous material. In myotubes these processes

are accompanied by the appearance of new organelles such as leptomeric bodies. Cyclic AMP has been found to prevent these changes.

Dr. William Blanc reports on work done with Dr. Deglon who prepared his thesis for Lausanne on the obligohydramnios syndrome, clinical and pathological manifestations. Research in collaboration with Dr. Naeye, University of Pennsylvania at Hershey on inter-relations of poverty, nutrition and perinatal mortality was continued along with investigation of the role of heroin addiction on fetal growth and morbidity. Dr. Wigger continues to apply electron microscopy to problems in neoplasia.

In the F. Higginson Cabot Laboratory of the Division of Surgical Pathology, studies have continued on comparative morphologic and functional aspects of normal and abnormal colonic mucosa and on the probable precancerous role of adenomatous mucosa. Dr. Cecilia Fenoglio, in collaboration with Drs. Nathan Lane and Gordon Kaye has demonstrated the absence of lymphatics in normal, hyperplastic and adenomatous colonic mucosa and related this finding to the rarity of metastasis from small carcinomas in pedunculated adenomas. The same group, with Dr. Robert Pascal, has also described the comparative ultrastructure of normal hyperplastic and adenomatous colonic epithelium. In addition, they are currently investigating the nature of the epithelio-mesenchymal interface in these tissues and, with Dr. Ralph Richart, they are carrying on correlated transmission and scanning electron microscopic studies of adenomas, hypersecretory villous adenomas and adenocarcinomas of the colon. Dr. Kaye, in collaboration with Drs. Frank Hoeffle and Anthony Donn (Ophthalmology) has continued studies on the nature, function and variability of the corneal endothelial barrier in the maintenance of normal corneal hydration. Dr. Kaye, Drs. Raffaele Lattes and Yao-Shi Fu have continued a transatlantic collaboration with Drs. Giulio Gabbiani and Guido Majno of the University of Geneva on correlated light and electron microscopic studies of soft tissue tumors.

Dr. Marianne Wolff continued her study of lymphangiomyoma, using transmission and scanning electron microscopy; the study of retro-rectal cysts with Dr. William Campbell, (Radiology); and the study of primary epithelial neoplasms of the appendix (excluding carcinoid) with Dr. N. Ahmed, (Department of Surgery, Grasslands Hospital). Dr. Karl H. Perzin, has completed studies on lymphosarcoma of the small intestine and papillary adenoma of the nipple.

Dr. Richart and Dr. Alex Ferenczy in the Division of Ob/Gyn. Pathology have continued their interest in endocrine-dependent neoplastic lesions and have examined them by using the technique of Fuelgen Microspectrophotometry. In addition, the division has continued its research on the contraceptive value of tubal ligation by chemical blockage procedures and has initiated a new long-range study on women who have had copper-covered intrauterine contraceptive devices (CU-T and CU-7) inserted. The specific aim of this study is the quantitative and qualitative evaluation and fate of endouterine copper released from these IUCDs as related to their antifertility effect.

Dr. Austin Johnston, Division of Orthopedic Pathology, studied the ultrastructure of round cell tumors important in the differential diagnosis of Ewing sarcoma of bone with Dr. C. Andrew L. Bassett (Orthopedic Surgery).

Drs. Lester Geller and David Cowen, Division of Neuropathology, continued their long-term studies in rats, of the etiology and consequences of perinatal brain damage, with emphasis on the development of methods for modifying, postnatally, the retarding effect of prenatally-induced brain damage on learning and motor abilities. Dr. William Markesbery, Philip Duffy, and David Cowen completed a study of the first cases of granular cell tumors believed to be primary in the central nervous system. Dr. Duffy, joined by Dr. Arthur Hays, is continuing his studies of the effects of polyamines on the growth of brain tumor cells (meningiomas) in tissue culture. His studies of murine influenza encephalitis, utilizing light and electron microscopy, and immunofluorescent techniques, suggest that the virus initially has a predilection for ependymal cells; later there is extension of virus antigen from cell to cell. Drs. Wolf, Jean Gamboa, Donald Harter and Konrad Hsu (Microbiology), using a fluorescent antibody technique, are continuing their studies of the etiology of post-encephalitic parkinsonism.

Drs. Richard Defendini and Earl Zimmerman, (Neurology) are studying biopsies of human pituitary adenomas for growth hormone and prolactin content by immunohistochemical techniques. Dr. Herbert Barden's studies have shown that the neuromelanin granule is a lysosomal derivative with a high sulfur content. Dr. Virginia Tennyson's research concerns the fetal development of catecholamine areas in the nervous system, i.e. the caudate nucleus, the substantia nigra, and the sympathetic ganglia. These areas are being studied by both fluorescence and electron microscopy. Where possible, studies have been done on the biogenic amine

levels and the uptake of radioactive amines by these tissues in collaboration with neurochemists in the Parkinson Research Group.

The structural changes of the smooth component of the endoplasmic reticulum and alterations in distribution of thiamine pyrophosphatase enzyme reaction products in the CNS and liver have been observed by Dr. Leon Roizin in cooperation with Drs. Shigeo Hashimoto and Kuo-Jung Tom, Mr. Jevons C. Liu and Mrs. Barbra Eisenberg-Gelber, all of the Psychiatric Institute, in acute and chronic methadone experiments in rats. Dr. Nicholas Willson in cooperation with Dr. Philip Duffy completed the study on the effects of combined BCNU and radiation therapy on glioblastoma multiforme.

The Division of Clinical Pathology reports that Drs. Kenneth F. Button and S. Raymond Gambino, with the assistance of the Medical Data Processing Department, developed a new control program for reporting laboratory results. They also developed an on-line quality control program for the chemistry laboratory. Dr. Gambino with Dr. G. Lum studied paired samples of plasma and serum for possible differences in chemical constituents, and with Dr. Robert S. Galen, a detailed study of multiple myocardial infarction. They are developing an optimized pattern of enzyme testing which could be used nationwide.

The Urology Research Laboratories under the direction of Dr. Myron Tannenbaum continued the morphologic and immunopathological studies of genitourinary neoplasms with particular reference to their earlier and more precise diagnosis. Experiments are in progress in the isolation and purification of specific antigens associated with prostatic, renal, cervical and other genitourinary cancers. Early experiments have been performed with tissue tests on frozen sections of tumor using fluorescein-labeled antibodies to carcino-embryonic antigen (CEA), tumor-associated antigen (TAA), human immunoglobulins and complement. In conjunction with Dr. Earl Zimmerman (Neurology) and Dr. Konrad Hsu, localization of neurosecretory proteins in supraoptic and paraventricular regions of the hypothalamus-pituitary tissues of monkey and calf using the indirect immunoperoxidase as well as the 3-layer bridge techniques have been reported.

Dr. A. Whitley Branwood has completed his work with Dr. Rubler (Department of Medicine, New York Medical College) on cardiomyopathy associated with diabetic nodular glomerulosclerosis. The findings in this study suggested that the cardiomyopathy encountered in these cases is in all probability due to microangiopathy seen in the

small inter-coronary arterioles; the thickening of these vessels is due to the excess accumulation of subendothelial acid mucopolysaccharide. Dr. Fierer is investigating the isolation and identification of tumor-associated antigens in fetal and neoplastic tissues. With Dr. Sidney Werner (Medicine), he is performing immunofluorescent studies in "Grave's Disease" and chronic thyroiditis: with Dr. R. McIntosh (Pediatrics), he is studying anti-glomerular basement membrane antibodies in renal transplant patients, and with Dr. Hugh Evans (Pediatrics), he is studying the role of alpha-1-antitrypsin in the respiratory distress syndrome. Dr. Lewis Johnson, in collaboration with Dr. E. Wirosko, (Ophthalmology) has continued to collect data on the properties of a unique microbial agent associated with chronic human eye disease. Drs. John Fenoglio and Bernard Wagner are continuing their studies of spontaneous canine congestive heart failure and canine mitral valvular fibrosis in collaboration with Drs. Wit and Bassett (Pharmacology) and Drs. Tilley and Hurvitz (Animal Medical Center). Dr. Robert Pascal, with Dr. Robert Kassel of the Sloan-Kettering Institute, is studying the immunologic mediation of the therapeutic activity of interferon in murine leukemia and the subsequent evolution of proteinuria with glomerular basement membrane damage in leukemic mice.

Dr. John G. Gorman conducted clinical trials of RhoGAM in mothers. To date 172 of the 497 mothers in the clinical trial of RhoGAM have delivered subsequent Rh positive babies. None of the 139 treated mothers were sensitized at the time of this subsequent delivery whereas 4 of the 33 control mothers were immunized and their babies affected. 20 of the above 139 treated mothers have delivered a third unaffected Rh positive baby. RhoGAM protection is complete at the second Rh positive pregnancy in the Columbia-Presbyterian study.

Dr. Jack W. C. Hagstrom continued to collaborate closely with Dr. Frank Veith (Albert Einstein School of Medicine) on the study of rejection and other aspects of lung transplantation. They have recently reviewed material from all of the cases of human lung transplants that have been performed (31 to date). The longest survival was nine months. Drs. T. Roberts and John Wu report that the simplified leukocyte migration inhibition test (MIT) has proved to be a specific, sensitive and rapid test for the study of cellular hypersensitivity. They have employed this technique in developing an in vitro Kveim test for the diagnosis of sarcoidosis. Dr. Angus Sampath did collaborative re-

research with Dr. Harold Bruck, (Surgery) on comparative clinical trials of hydron-coated and uncoated latex urinary catheters in surgical patients, and Dr. Prem Chauhan worked on fetal pathology and mechanism of death in Saline-induced abortions.

Dr. Hans Kaunitz states that his long-term experiment dealing with the influence of ten different commonly eaten fats and oils has been brought to a conclusion. The study showed that the consumption of vegetable oils was associated with a significantly higher incidence of degenerative disease of heart and liver than was that of animal fats. Also concluded were studies of milk substitutes in which various fats were substituted for the naturally occurring butter fat. After feeding these "filled milks" to primates for five years, it was concluded that coconut oil is acceptable as a substitute for milk fat in such products.

Dr. Liselotte Graf with Dr. Henry Rapport (Biochemistry) continued studies on malignant tumors in order to establish the molecular basis for immunological differences between the plasma membranes of human tumor cells and normal cells. Major emphasis was placed on cytolipin H, a glycosphingolipid hapten which, as studies suggest, may be a significant indicator of malignant transformation. The work carried out in collaboration with Dr. Mary E. King included studies of cytotoxicity of antisera to human tumors and lactose-protein conjugates for HeLa cells, mediated through cytolipin H determinants.

Dr. D. W. King and Mr. Claude Tihon report a new method for the isolation of collagen-synthesizing polysomes which yield a single peak from which the rapidly labelled putative message previously described can be obtained in purer form. Further investigations of mitochondrial regulation of cytoplasmic syntheses with Dr. Mary E. King showed that inhibitors of metabolism yielded results similar to compounds which interfered directly with autonomous mitochondrial syntheses. Pinocytosis and the intracellular disposition of ingested protein were studied by reinsertion of the labelled protein from treated cells.

The Third Annual Educational Symposium was held at P&S on April 5, 1972 and presented a wide display of audiovisual computer hardware and their application in education and medicine. Included were super-8 movies, cassette color video tapes, slide show with audio tape and computer-aided instructional programs.

The Graduate Seminar series under the direction of Dr. Henry Vogel was arranged around the area

of neurobiology and included guest speakers as follows: Henry Webster (NIH), Malcolm Carpenter (Anatomy), Francis V. Schmidt (MIT), David Nachmansohn (Biochemistry), Bruce McEwen (Rockefeller Univ.), Lucien Côté (Neurology), Dominick Purpura (Einstein College), and Richard Babayan and Armand Mirmanda of the Pathology Department.

Drs. Michael Katz (Tropical Medicine), Donald Harter (Neurology), Philip Duffy and Ralph Richart participated in the Aspen Seminars devoted to pathobiology.

The postgraduate course in orthopaedic surgery and pathology has been changed from December to June 1973 and is undergoing major revision with Dr. Mathes' help under the guidance of Dr. Garcia.

The Division of Ob/Gyn. Pathology has acquired a color video television system which is used for pathological diagnosis and for teaching the residents. In addition, an audiovisual system and two carrels have been installed in a newly acquired residents' room.

Drs. David Cowen and Philip E. Duffy presented a newly organized 4-month course in neuropathology for trainees in the Division of Neuropathology and residents at the Medical Center combining lecture, discussion, and laboratory study at the microscope.

Staff Changes

Dr. Jack W. C. Hagstrom was acting director of the Division of Pathology at Harlem Hospital during Dr. T. Robert's sabbatical leave.

New Appointments

Dr. Conrad L. Pirani, Professor of Pathology; Dr. Lewis Shapiro, Clinical Professor of Dermatology and Pathology; Dr. Thomas Blumenfeld, Assistant Professor of Pediatrics and Pathology; Drs. Lazarevic Bozidar, Ada B. De Chabon and Paul T. Wertlake, all Assistant Clinical Professors of Pathology; Herbert Barden, Associate in Neuropathology, John M. Scott, Visiting Lecturer.

Promotions

Dr. Robert Pascal, Associate Professor of Pathology; Dr. Lloyd Roberts, Assistant Clinical Professor and Dr. Hyman Donnenfeld, Lecturer.

Retirement

Dr. Gregory Brown, Harlem Hospital.

Resignations

Drs. John L. Tullis, Elliott M. Gross, Julian I. Joseph, George Munsick.

Honors

Dr. Virginia Tennyson was elected President-elect of the New York Society for Electron Microscopy. Dr. Lester M. Geller was elected to the Editorial Advisory Board of the *Journal of Neuro-pathology and Experimental Neurology*.

Dr. S. Raymond Gambino was invited to give the opening address at Grand Rounds at the medical school of the University of Minnesota. He spoke on the interpretation of laboratory tests—what is normal? Dr. Gambino was also invited to speak in London, Manchester and Edinburgh by the British Society of Clinical Pathologists.

Dr. M. Melicow lectured on endometrial carcinoma of the prostate gland on October 19, 1971, at the Hadassah Hospital Medical Center, Jerusalem, Israel and at the Rambam Hospital in Haifa, Israel on October 26, 1971 on the herald lesion of the bladder.

Dr. Branwood gave a lecture at Guy's Hospital, London, entitled "A Pathologist Looks at Cancer."

Dr. Jacob Furth was honored by an invitation of the President to be present at the signing of the bill appropriated by Congress for the formulation of research possibilities under the National Cancer Plan. He was invited to summate the symposium on mammary neoplasia, November, 1971 held at the Institute for Medical Research, Cherry Hill, New Jersey. He was also invited to participate in the workshop on prolactin and carcinogenesis at the Tenovus Institute for Cancer Research of the Welsh National School of Medicine, Cardiff, Wales, March, 1972.

Dr. Prem M. Chauhan is editor of *Pathology Newsletter*, Harlem Hospital Center, Monthly.

The results of Dr. Hans Kaunitz' research were presented in symposia chaired by Dr. Kaunitz in Los Angeles and in Mexico City.

Dr. William Blanc gave a postgraduate course on placental and perinatal pathology in Lima, Peru at the Lima Lying-in-Hospital under the sponsorship of the Ministry of Health of Peru. He gave a course on pediatric pathology at the VIII Latin-American-Pathology Congress in Maracabo and was a visiting professor at the Mount Sinai Hospital of Greater Miami.

Dr. Jack Hagstrom was Visiting Professor of Pathology/Cardiology at the University of Caracas in June 1972.

Acknowledgments

Sources of research support include: National Institute of Arthritis and Metabolic Diseases, American Cancer Society, The National Association for Retarded Children, the Matheson Foundation, the Muscular Dystrophy Association, the Clinical Center for Parkinson and Allied Diseases (U.S.P.H.S. — supported), the National Institute of Neurological Diseases and Stroke, U.S.P.H.S., Foundation for Ileitis and Colitis, Inc., National Institutes of Child Health and Human Development, NINDS, National Cancer Institute, United States Atomic Energy Commission, National Institute of General Medical Sciences, National Institute of Allergies and Infectious Disease, Damon Runyon Foundation, Lasdon Foundation, Stony Wold Foundation, ORTHO Research Foundation, National Association for Tuberculosis and Respiratory Diseases and Merck Foundation.

Donors: Mr. and Mrs. Jacques Weber, Mr. Richard Barnes, Mrs. Ruby Schinasi, Mr. Paul C. Blum and Mr. Norman C. Norman.

At Harlem Hospital, the urinary catheter studies are being funded by a grant from the G. D. Searle Company.

1972 Publications

Pathology

- Barden, H.
The histochemical distribution and localization of copper, iron, neuromelanin and lysosomal enzyme activity in the brain of aging rhesus monkey and the dog. *J. Neuropath. Exp. Neurol.* **30**:650-667, 1971.
Distribution of neuromelanin and catecholamines in the brainstem. *Lancet* **2**:923, 1971.
- Barden, H. and Martin, E.
Electron probe microanalysis of neuromelanin and lipofuscin. In: *Pigmentation: Its Genesis and Biologic Control*. V. Riley, ed., Appleton-Century-Crofts, New York, 1972.
- Barrett, R. E.; Cote, L.; Tennyson, V. M. and Mytilineou, C.
The neostriatum of fetal rabbit following injection of L-Dopa: A biochemical, histofluorescent, and electron microscopic study. *J. Neuropath. Exp. Neurol.* **31**:166, 1972.
- Becker, N. H.; Sinha, S. S. B.; Hagstrom, J. W. C.; Blumcke, S. and Veith, F. J.
Fine structure alterations in canine lung transplants. *J. Thoracic Cardiovasc. Surg.* **63**:81-93, 1972.
- Blanc, W. A. and Naeye, R. L.
Fetal renal structure and the genesis of amniotic fluid disorders. *Amer. J. Path.* **67**:95, 1972.
- Bonfiglio, T. A.; Botti, R. E. and Hagstrom, J. W. C.
Coronary arteritis, occlusion, and myocardial infarction due to lupus erythematosus. *Amer. Heart J.* **83**:153-158, 1972.
- Buda, Joseph A.; Suciu-Foca, Nicole; Fierer, Joshua A. and Geering, Gayla
Induction of runt disease in newborn rats by prolonged antigenic stimulation with acellular tissue extracts. *Transplantation* **13**:332-335, 1972.
- Canfield, Robert E.; Kaye, Gordon I and West, Susan B.
The preparation and evaluation of tritiated polyalanyl insulin derivatives. *Endocrinology* **90**:112-122, 1972.
- Cohen, G.; Heikkila, R.; Tennyson, V. M.; Cote, L.; Barrett, R. E. and Mytilineou, C.
Biochemical, histofluorescent, and electron microscopic studies of the neostriatum in the fetal and adult rabbit. Proc. 11th Ann. Meeting, Amer. Soc. Cell Biol., New Orleans, 1971.
- Cosman, Bard and Wolff, Marianne
Acne keloidalis. *Plastic and Reconstr. Surgery* **50**:25-30, 1972.
Correlation of keloid recurrence with completeness of local excision. A negative report. *Plastic and Reconstr. Surgery* **50**:163-166, 1972.
- DeSantis, M. E.; Whetsell, W. O., Jr. and Francis, K. J.
Localization of normal and reinnervated mammalian muscle spindles for microscopy. *Brain Research* **39**:240-244, 1972.
- Duffy, Philip E.; Defendini, R. and Kremzner, L. T.
Regulation of meningioma cell growth in vitro by polyamines. *J. Neuropath. Exp. Neurol.* **30**:698-713, 1971.
- Evans, Hugh E.; Sampath, Angus C.; Douglass, Frances and Baki, Alphonse
Shigella bacteremia in a patient with sickle cell anemia. *Am. J. Dis. Child* **123**:238-239, 1972.
- Fenoglio, Cecilia M.; Lane, Nathan and Kaye, Gordon I.
Distribution of lymphatics in normal, hyperplastic and neoplastic human colonic mucosa. *Arch. Mexicano de Anat.* **39**:16, 1972.
Distribution of colonic lymphatics: Their possible significance in colonic neoplasia. *Anat. Rec.* **172**:309, 1972.
- Fenoglio, John J., Jr. and Pham, Tuan Duc
Ruptured chordae tendineae: An electron microscopic study. *Human Pathology* **3**:419-420, 1972.
- Fenoglio, John J., Jr.; Pham, Tuan Duc; Wit, Andrew L.; Bassett, Arthur L. and Wagner, Bernard M.
The canine mitral complex: Ultrastructural and electromechanical properties. *Circulation Research* **31**:417-430, 1972.
- Fenoglio, John; Wit, Andrew L.; Hurvitz, Arthur and Wagner, Bernard M.
The canine mitral complex. *Federation Proceedings* **31**:621a, 1972.
- Ferenczy, Alex; Fenoglio, John J., Jr. and Richart, Ralph
Observations on benign mesothelioma of the genital tract (adenomatoid tumors): A comparative ultrastructural study. *Cancer* **30**:244-260, 1972.
- Ferenczy, Alex and Richart, Ralph M.
The fine structure of the gonads in the complete form of testicular feminization syndrome. *Amer. J. Obstet. & Gynec.* **113**:399-409, 1972.
- Ferenczy, Alex and Richart, Ralph M.
The ultrastructure of perianal Paget's Disease. *Cancer* **29**:1141-1149, 1972.
- Ferenczy, Alex; Richart, Ralph M.; Agate, Frederick J. Jr.; Purkerson, Mabel L. and Dempsey, Edward W.
Scanning electron microscopy of the human endometrial surface epithelium. *Fertil. & Steril.* **23**:515, 1972.
Scanning electron microscopy of the human fallopian tube. *Science* **175**:783-784, 1972.
- Ferenczy, Alex; Richart, Ralph M. and Okagaki, Takashi.
A comparative ultrastructural study of leiomyosarcoma, cellular leiomyoma and leiomyoma of the uterus. *Cancer* **28**:1004-1018, 1971.
- Fierer, Joshua A.; LoGerfo, Paul and Bennett, Sidney
Immunofluorescent identification of a tumor-associated antigen in neoplastic and nonneoplastic human tissues. *Fed. Proc.* **31**:661, 1972.

- Freda, V. J.; Gorman, J. G.; Galen, R. S. and Treacy, N.
The need for RhoGAM following abortion. *Excerpta Medica Internatl Congress*, Series #255, 1971.
- Fu, Yao-Shi and Perzin, Karl H.
Lymphosarcoma of the small intestine. *Cancer* 29: 645-659, 1972.
- Furth, J.
Prolactin and carcinogenesis. In: *Prolactin and Carcinogenesis. Fourth Tenovus Workshop*. A. R. Boyns and K. Griffiths, eds., Alpha Omega Alpha Publishing, Cardiff, Wales, 1972.
- Epilogue to a symposium on mammary neoplasia: Quo vadis? *J. Nat. Cancer Inst.* 48:1235-1239, 1972.
- Gabbiana, Giulio; Fu, Yao-Shi; Kaye, Gordon I.; Lattes, Raffaele and Majno, Guido.
Epithelioid sarcoma. A light and electron microscopic study suggesting a synovial origin. *Cancer* 30:486-499, 1972.
- Gambino, S. Raymond
Context free results and their meaning in biochemistry. In: *Clinically Oriented Documentation of Laboratory Data*. E. R. Gabrieli, ed., Academic Press, New York, 1972.
- Godman, G. C.
The picornaviruses. In: *Virus Atlas*. A Dalton and F. Hagenau, ed., Academic Press, New York, 1972.
- Gorman, John G. and Freda, Vincent J.
Rh immune globulin is indicated for Rh-negative mothers undergoing sterilization. *Amer. Jnl. Obs. & Gynec.* 112:868-869, 1972.
- Gould, Victor E.; Wolff, Marianne and Mottet, N. Karle
Morphologic features of mammary carcinoma in women taking hormonal contraceptives. *Am. J. Clin. Path.* 57:139-143, 1972.
- Gump, Frank E.; Sakellariadis, Panos, Wolff, Marianne and Broell, John R.
Clinical and pathological investigation of regional enteritis as a guide to prognosis. *Annals Surgery* 176: 233-242, 1972.
- Harcke, H. T., Jr.; Naeye, R. L., Storch, A. and Blanc, W. A.
Perinatal cerebral intraventricular hemorrhage. *J. of Ped.* 80:37, 1972.
- Inoue, K.; Graf, L. and Rapport, M. M.
Immunohistochemical studies of organ and tumor lipids XIX. Cytolytic action of antibodies directed against cytolipin R. *J. Lipid. Res.* 13:119, 1972.
- Ito, Akihiro; Moy, Peggy; Kaunitz, Hans; Kortwright, K.; Clarke, S.; Furth, Jacob and Meites, Joseph
Incidence and character of the spontaneous pituitary tumors in strain CR and W/Fu male rats. *J. Nat. Cancer Inst.* 49:701, 1972.
- Ito, Akihiro; Furth, Jacob and Moy, Peggy
Growth hormone-secreting variants of a mammary tumor. *Cancer Res.* 32:48-56, 1972.
- Izuo, M.; Richart, R. M.; Okagaki, T. and Lattes, R.
Nuclear DNA content in hyperplastic lesions of cystic disease of the breast with special reference to malignant alteration. *Cancer* 28:620-627, 1971.
- Kassel, Robert L.; Pascal, Robert R. and Vas, Adrienne
Interferon mediated oncolysis in spontaneous murine leukemia. *J. Nat. Cancer Inst.* 48:1155-1157, 1972.
- Kaufman, M. A.; Roizin, L. and Gold, G.
Neuropathology. In: *Progress in Neurology and Psychiatry*. Chapter 4, XXVI.
- Kaye, Gordon I. and Cole, Jeanne D.
Localization of sodium in normal and inhibited transporting epithelia. *Proc. 29th Ann. Meeting, EMSA*, Boston, 392-393, 1971.
- Kaye, Gordon I.; Fenoglio, Cecilia M.; Pascal, Robert R. and Lane, Nathan
Comparative electronmicroscopic studies of normal human colonic epithelium of hyperplastic and adenomatous colonic polyps. *Arch. Mexicanos de Anat.* 39:22-23, 1972.
- Kaye, Gordon I.; Hoeffle, Frank B. and Sibley, Riley C.
Penetration of horseradish peroxidase into the intercellular spaces of rabbit and frog corneal endothelium. *Arch. Mexicanos de Anat.* 39:23, 1972.
- Kilcoyne, M. M.; Daly, J. J.; Gocke, D. J.; Thomson, G. E.; Meltzer, J. I.; Hsu, K. C. and Tannenbaum, M
Nephrotic syndrome in heroin addicts. *Lancet* 1 17-20, 1972
- King, M. E.; Godman, G. C. and King, D. W.
Respiratory enzymes and mitochondrial morphology of HeLa and L-cells treated with chloramphenicol and ethidium bromide. *J. Cell Biol.* 53:127-142, 1972.
- King, Mary E. and King, Donald W.
Respiratory enzyme activity and mitochondrial morphology of L cells under prolonged oxygen deprivation. *Lab. Invest.* 25:374-379, 1971.
- Knight, G. J.; Vogel, R. H. and Vogel, H. J.
Residual transcriptional and translational repression in argR mutants of *Escherichia coli*. *Genetics*, 71 s31 1972.
- Lum, Gifford and Gambino, S. Raymond
Serum gamma-glutamyl transpeptidase activity as an indicator of disease of liver, pancreas or bone. *Clin. Chem.* 18:358-362, 1972.
- Mazzarella, P.; Okagaki, T. and Richart, R. M.
Teratoma of the uterine tube. A case report and review of the literature. *J. Obstet. & Gynec.* 39:381-388, 1972.
- McLellan, W. L. and Vogel, H. J.
Translational and transcriptional components of repression by arginine in *Escherichia coli*. *Biochem. Biophys. Res. Commun.* 48:1027-1033, 1972.
- Repression by arginine in *Escherichia coli*: transcriptional and translational modes. *Genetics*, 71, s39 1972.
- Melicow, Meyer M.
A proper approach by the physician to the problem of intersexuality in infants and children. *Medical Aspects of Human Sexuality*, August, 1971.
- Melicow, Meyer M.
Terminology in uropathology: A plea for consensus including a discussion of retroplasia vs. metaplasia. *J. of Urology* 105:714-719, 1971.

- Unusual metastasis of the prostate gland. *Urologists' Letter Club*, 1971.
- Evolution of urology: Some famous patients. *Residents and Staff Physicians*, 17:60-73, 1971.
- Hippocrates, Celsus, and Galen—Founders and re-tarders of urology. *Clinical Medicine* 79:20-26, 1972.
- Melicow, Meyer M. and Tannenbaum, Myron
Ednometrial carcinoma of uterus masculinus (prostatic utricle) Report of six cases. *J. of Urol*, 106: 892-902, 1971.
- McIlwain, D. L.; Graf, L. and Rapport, M. M.
Membrane fragments from myelin treated with different detergents. *J. Neurochem.* 18:2255, 1971.
- Mesa-Tejada, Ricardo; Fierer, Joshua A.;
Klavins, Janis V.; Weiss, Michael and Berkman, James I.
Presence of fetal antigens in human malignant neoplasms as demonstrated by immunofluorescent microscopy. In: *Proce. of the Second Conf. and Workshop on Embryonic and Fetal Antigens in Cancer*. N. G. Anderson, ed., Oak Ridge, Tennessee, 1972.
- Naeye, R. L.; Burt, L. S.; Wright, D. L.;
Blanc, W. A. and Tatter, D.
Neonatal mortality. The male disadvantage. *Ped.*, 48:902, 1971.
- Naeye, R. L.; Dellinger, W. S. and Blanc, W. A.
Fetal and maternal features and antenatal bacterial infections. *J. of Ped.* 79:733, 1971.
- Nagatsu, M.; Richart, R. M. and Lambert, A.
Effects of bleomycin on the cell cycle of Ehrlich ascites carcinoma. *Cancer Research* 32:1966-1970, 1972.
- Okagaki, T. and Richart, R. M.
Systemic proliferating angioendotheliomatosis. A case report. *J. Obstet. & Gynec.* 37:(3)377-380, 1971.
- Parodi, Eduardo; Kaiser, Gerard A.; Wolff, Marianne, Kovalik, A.; Thomas, W. and Malm, James R.
Comparative study of the tensile strength of autogenous systemic veins and preserved homografts. *J. Surg. Res.* 12: No. 2, 1972.
- Perzin, Karl and Lattes, Raffaele
Papillary adenoma of the nipple (florid papillomatosis adenoma, adenomatosis) *Cancer* 29:996-1009, 1972.
- Razin, S.; Chanock, R.; Graf, L. and Rapport, M. M.
Immunogenicity of cytolipin H aggregated with acholeplasma laidlawii membranes proteins. *Proc. Soc. Exper. Biol. and Med.* 138:404, 1971.
- Richart, R. M. and Prager, D. J. (eds.).
Human Sterilization. Charles C. Thomas, Springfield, Ill. 1972.
- Rodriguez, M.; Okagaki, T. and Richart, R. M.
Mycotic endometritis due to candida. Report of a case and review of the literature. *J. Obstet. & Gynec.* 39:292, 1972.
- Roizin, L.
Introduction to metabolic diseases. In: *Pathology of the Nervous System*, Vol. 2:1267-1273, 1971.
Evolution of fundamental CNS pathogenic concepts. In: *The World of Biennial of Psychiatry and Psychotherapy*, 1:560-602, 1971.
- Neurotoxicology probes into drug hazards. *Ment. Hyg. News*, 42:6, 1971.
- Roizin, L.; Akai, K.; Alexander, G.; Machiz, S. and Liu, J. C.
Phenothiazine pathogenic mechanisms in liver dysfunctions. *Fed. Proc.* 30:574, 1971.
- Roizin, L.; Caveness, W. F.; Carsten, A. L. and Liu, J. C.
Synaptic preservation in old post x-irradiation lesions (EEG and electron microscope observations). *Trans. Amer. Neurol. Assn.* 96:295-297, 1971.
- Roizin, L.; Gold, G.; Alexander, G.; Miles, B.; Kaufman, M. A. and Akai, K.
Prenatal effects of hallucinogens. In: *Drug Abuse-Concepts and Research*. W. Keup, ed., Charles C. Thomas, Springfield, Ill., 1971.
- Roizin, L.; Hashimoto, S.; Liu, J. C.; Tom, K. J. and Eisenberg, B.
Methadone effects upon the central nervous system. TPP, AcP and G-6-P. *J. Histochem., Cytochem.* 19: 720-721, 1971.
- Roizin, L.; Helpfern, M.; Baden, M.; Kaufman, M. A.; Hashimoto, S.; Liu, J. C. and Eisenberg, B.
Neuropathology of drug dependence. In: *Chemical and Biological Aspects of Drug Dependence*. S. J. Mule and H. Brill, eds., CRC Press, Cleveland, 1972.
- Roizin, L.; Jervis, G.; Kaufman, M. A.; Popovitch, E. and Hashimoto, S.
Senile plaque pathogenesis in Down's, Alzheimer's and senile disease. *Jour. of Neuropath. and Exper. Neurol.* Vol. XXXI:188, 1972.
- Roizin, L. and Kaufman, M. A.
Dyslipidoses. *Pathology of the Nervous System*. 2: 1284-1314, 1971.
Gargoylism (Pfaundler-Kurler-Hunter Syndrome). *Pathology of the Nervous System* 2:1314-1324, 1971.
- Rubler, Shirley and Branwood, A. Whitley
A new type of cardiomyopathy associated with diabetic nodular glomerulosclerosis. *Circulation* 44:219, 1971.
- Shapiro, Lewis and Zegarelli, David J.
The solitary labial lentigo. *Oral Surg., Oral Med. & Oral Path.* 31:81-92, 1971.
- Snyder, Richard N. and Perzin, Karl H.
Papillomatosis of nasal cavity and paranasal sinuses (inverted papilloma, squamous papilloma) *Cancer* 30:668-690, 1972.
- Tennyson, V. M.; Heikkila, R.; Cohen, G.; Cote, L.; Barrett, R. E. and Mytilineou, C.
Studies on the neostriatum of late fetal, postnatal, and adult rabbits using biochemical, histogluorescent, and electron microscopic methods. *Anat. Rec.* 172:416, 1972.
- Tennyson, V. M.; Barrett, R. E.; Cohen, G.; Cote, L.; Heikkila, R. and Mytilineou, C.
The developing neostriatum of the rabbit: Correlation of fluorescence histochemistry, electron microscopy, endogenous dopamine levels, and H³-dopamine uptake. *Brain Research* 46:251-285, 1972.

- Tennyson, V. M.; Mytilineou, C. and Barrett, R.
Histofluorescent and electron microscopic studies of the developing substantia nigra in the rabbit. *Proc. 2nd Annual Meeting of the Soc. for Neuroscience*, Houston, Texas, 1972.
- Thrasher, T. and Richart, R. M.
Ultrastructure of the Arias Stella reaction. *Amer. J. Obstet. & Gynec.* 112 (1)113, 1972.
An ultrastructural comparison of endometrial adenocarcinoma and normal epithelium. *Cancer* 29:1713-1723, 1972.
- Tomashefsky, P., Furth, J.; Lattimer, J. K.;
Tannenbaum, M. and Priestley, J.
The Furth-Columbia rat Wilms tumor. *J. Urol.* 107: 348, 1972 and *A.A.G.U.S.* 63:28-34, 1971.
- Vasudeva, K.; Thrasher, T. and Richart, R. M.
Chronic endometritis: A clinical and electron microscopic study. *Amer. J. Obstet. & Gynec.* 112:749-758, 1972.
- Veith, F. J. and Hagstrom, J. W. C.
Alveolar manifestations of rejection: An important cause of the poor results with human lung transplantation. *Ann. Surg.* 175:336-348, 1972.
- Veith, F. J.; Sinha, S. B. P.; Blumeke, S.;
Dougherty, J. C.; Becker, N. H.; Siegelman, S. S. and Hagstrom, J. W. C.
Nature and evolution of lung allograft rejection with and without immunosuppression. *J. Thorac Cardiovas. Surg.* 63:509-520, 1972.
- Vogel, R. H.; Knight, G. J. and Vogel, H. J.
Altered translational or transcriptional components of repression in *argR* mutants of *Escherichia coli*: evidence from a translation retarder. *Biochem. Biophys. Res. Commun.* 48:1034-1040, 1972.
- Werner, Sidney C.; Wegelius, Otto; Fiere, Joshua A. and Hsu, Konrad C.
Immunoglobulins (E, M, G) and complement in the connective tissues of the thyroid in Grave's Disease *N.E.J.M.* 287:421-425, 1972.
- Wolf, A. and Cowen, D.
Perinatal infections of the central nervous system
In: *Pathology of the Nervous System*. J. Minckler ed., McGraw-Hill Book Co., New York, 1972.
- Yahr, Melvin D.; Wolf, A.; Antunes, J.; Miyoshi, K. and Duffy, P.
Autopsy findings in parkinsonism following treatment with levodopa. *Neurology* 22:56-71, 1972.

Pediatrics

RICHARD E. BEHRMAN

Professor and Chairman of the Department • Director of Service

The Department of Pediatrics has undergone an expansion in clinical services, teaching, and research activities during the past year. Babies Hospital, the Children's Medical and Surgical Center of New York, continues its extension into its new wing and renovation of the existing facilities for children. In addition, there has been significant progress in the integration of medical student teaching programs on the Pediatric Services at Babies, St. Luke's, Roosevelt, and Harlem Hospitals.

Changes in Staff

Dr. Anastasios Anastasiades was appointed Acting Director of the Pediatric Service and Dr. Marianne Schwob Acting Director of the Children's and Youth Project at Roosevelt Hospital.

Dr. Myron Winick was appointed Professor of Pediatrics and Director of the Institute of Human Nutrition. Dr. Michael Katz was appointed Professor of Tropical Medicine and Pediatrics and Acting Director of the Division of Infectious Diseases. Dr. George I. Lythcott, Associate Dean for Urban and Community Health Affairs, was promoted to Professor of Pediatrics.

Dr. John F. Nicholson was promoted to Associate Professor of Pediatrics and appointed Coordinator of Babies Hospital Laboratories and Director of the Babies Hospital Clinical Chemistry Laboratory. Dr. Thomas Blumenfeld joined the faculty as Assistant Professor of Pediatric Pathology and Associate Director of the Laboratory.

Dr. Robert B. Mellins was promoted to Associate Professor of Pediatrics and appointed Director of

the Division of Pediatric Pulmonary Diseases, Dr. Carolyn R. Denning, Head of the Pediatric Pulmonary Center, was promoted to Associate Professor of Clinical Pediatrics.

Dr. Ralph B. Dell was promoted to Associate Professor of Pediatrics and named Career Scientist by the Health Research Council of the City of New York. Dr. Jo Anne Brasel was appointed Associate Professor of Pediatrics and Director of the Division of Growth and Development in the Institute of Human Nutrition. Dr. Rawle McIntosh, Director of the Division of Immunology, was promoted to Associate Professor of Pediatrics. Dr. Ruth Harris was promoted to Associate Professor of Clinical Pediatrics. Dr. Susan G. Gordon has been appointed Associate Professor of Clinical Pediatrics in the Division of Pediatric Ambulatory Care. She will have a major responsibility for clinical teaching in the clinic.

Dr. Martin I. Lorin was appointed Director of the Division of Pediatric Medical Education and assumed overall responsibility for medical student, house staff, and postgraduate education programs.

Dr. William J. Davis was appointed Assistant Professor of Pediatrics and Director of the Division of Pediatric Allergy. In the Division of Pediatric Cardiology Dr. Ehud Krongrad was promoted to Assistant Professor of Pediatrics and Dr. Constance Hayes to Assistant Professor of Clinical Pediatrics. Drs. Celia Ores and Pureza F. M. Gaerlan were promoted to Assistant Professors of Clinical Pediatrics. Dr. Narayan R. Shah was appointed Associate in Pediatrics.

Dr. Jerry C. Jacobs was promoted to Associate Clinical Professor of Pediatrics. The following were appointed Assistant Clinical Professors: Drs. Robert E. Appleby; Yvonne T. Driscoll; Bernard R. Feldman; Stephen Glaser; Robert E. Jennings; Joseph E. Kalbacher; Hunter C. Leake, III; Shirley A. Mayer; Daniel J. Melia; Walter L. Mitchell; Thomas W. Patrick; Herbert E. Poch; Morton H. Rachelson; Roderick C. Richards; Albert P. Rosen; Joseph A. Silverman; Gilbert Simon; William H. Smith; Walter R. Stankewick; David Stiles; Carl S. Strand; Elizabeth Ufford; Robert West; Robert C. Wheeler; Leo. F. J. Wilking; and Preston Zucker. Drs. John L. Costa, Mary R. Richards, and Sheila A. Shanahan were appointed Instructors. Drs. Stanley Morrison and Roger Challop were appointed Associates.

The following resignations from the staff were accepted: Drs. Robert H. Bierman (Associate); Joseph Bordiuk (Associate); Morris Factor (Assistant); O. Robert Levine (Associate Professor); Jeanette Marlow (Assistant); Frederick A. Schulaner (Assistant); Marvin Siegler (Assistant); Donald Winokoff (Instructor).

With great sadness the staff marked the sudden death of Dr. Milton Singer who was loved and respected by his colleagues, friends, and patients. The Milton Singer Memorial Fund has been established in his honor.

Staff Honors and Activities

Dr. Richard E. Behrman was appointed Chairman of the National Academy of Science, National Research Council, Committee on Phototherapy of the Newborn. He was also appointed Editor of the *Journal of Pediatric Research*, and elected to the Executive Committee of the Faculty Council.

Dr. L. Stanley James, Director of the Division of Perinatology, was appointed Chairman of the Committee on Perinatal Biology and Infant Mortality of the National Institute of Child Health and Human Development and a special consultant to the FDA.

Dr. George I. Lythcott was elected a member of the Institute of Medicine of the National Academy of Sciences. He was also appointed to the Executive Committee of the Health Research Council, City of New York, and elected to the Board of Trustees, the Phelps Stokes Foundation, New York.

Dr. Robert W. Winters was chairman of two interdisciplinary conferences sponsored by the National Institute of Child Health and Human Development. Dr. Michael Katz was guest lecturer at the European Society for General Microbiology and

the National Hospital for Nervous Diseases, England. He was reappointed to the Subcommittee on the Interactions of Nutrition and Infection of the National Research Council. Dr. Jo Anne Brasel was elected to the Council of the Lawson Wilkins Pediatric Endocrine Society.

Dr. Robert Mellins served as chairman, Scientific Assembly on Pediatrics of the American Thoracic Society and of the Committee on Clinical Research, National Cystic Fibrosis Research Foundation.

Dr. John Nicholson served as Chairman of the Education Committee and member of the Executive Committee of the Neighborhood Action Program of Washington Heights-Inwood-Marble Hill, a division of the office of Neighborhood Government of the City of New York. He was also appointed to Community Board #12, the northern Manhattan advisory committee to the Borough President.

Dr. Joe Cannon, Director of the Pediatric Service of the Mary Imogene Bassett Hospital, was appointed Director of the Medical Rehabilitation Program for Osteo County.

Teaching

The faculty, under the leadership of Dr. Martin I. Lorin, Director of Education, reviewed and modified the elective program for medical students. An integrated pediatric elective in growth, development and nutrition and clinical pediatrics was formulated by Drs. Winick and Lorin. The elective program for first year medical students was continued and a supplementary program offered in the second year, prior to the required clerkship and regular elective program. Approximately 50 third and fourth year students chose electives in pediatric ambulatory care. The clerkship was modified to include experience in pediatrics at Roosevelt, St. Luke's, and Harlem Hospitals.

A series of symposiums of the Babies Hospital Attending Postgraduate Association were held under the auspices of the Division of Ambulatory Care. In addition, a special series of lectures for physicians caring for private patients in Washington Heights was initiated.

Dr. Nicholson was instrumental in initiating an agreement between Columbia-Presbyterian Medical Center and George Washington High School for a work study program in health sciences for senior high school students.

Patient Care

The total admissions to Babies Hospital of children and youths from birth to 21 years continued to increase steadily during the year to a total of

5,516 admissions. In addition, there was an even greater increase in Pediatric Clinic visits to a total of approximately 80,000.

A satellite pharmacy was opened on the pediatric clinic floor to decrease patient waiting time and improve the effectiveness of individual pharmacy instructions given to patients. A pilot project was initiated in the Pediatric Allergy Clinic to enable school age children to receive treatment without the necessity of school absences. This clinic was also reorganized and expanded. A full-time clinic coordinator and social worker have been added to permit an increase in in-depth care.

A system for telephone consultation was initiated for a number of day care centers in the neighborhood by the Division of Ambulatory Care.

A detailed systems analysis of patient flow and services in the Pediatric Clinics was undertaken by Mr. Hines and Drs. Bauman, Asnes, and Grebin. This study has become the framework for plans to restructure the administration of the Pediatric Clinics.

Dr. Calvin H. Sinnette, Director of the Division of Social and Community Pediatrics, initiated a comprehensive program for School Health Services and Health Education in Public Schools #46 and 156, Manhattan, utilizing a wide range of health workers and physicians.

A marked improvement in ventilation therapy in Babies Hospital has been achieved by the efforts of Drs. Hyman and Epstein of the Division of Perinatology; they have adapted a miniaturized ventilator designed by Mr. Arnold Lee to meet the needs of small infants.

Under the direction of Drs. Nicholson, Blumenfeld, and Pesce, a program of automation has begun which will provide Babies Hospital with the first fully automated microchemistry laboratory in the world. Babies Hospital Clinical Chemistry has assumed responsibility for the metabolic screening program for neurologic diseases and expanded service for the diagnosis of inborn errors of metabolism.

Research

Computer programming in the Newborn Lung Center for the longitudinal study of obstetric clinic, labor, delivery, and neonatal data was completed, as were plans to install an on-line maternal and fetal monitoring and distress analysis system for up to five women at a time during delivery. Over 100 infants have been enrolled in Drs. Driscoll's and Koenigsberger's follow-up clinics. Studies of experimental RDS in lambs by Drs. Gersony and

James suggest that right to left shunting during early respiratory distress is at the level of the foramen ovale rather than the lungs.

Dr. Ralph R. Dell and Dr. Paul J. Cannon embarked on a series of experiments designed to measure regional renal, myocardial, and cerebral blood flow utilizing the ^{133}Xe washout techniques. Dr. Dell and Dr. DeWitt S. Goodman have initiated an investigation of the kinetics of the long-term turnover of plasma cholesterol employing mathematical models. Drs. William C. Heird, John M. Driscoll, Jr., John E. Nicholson, and Winters, in collaboration with Dr. John N. Schullinger and Dr. Thomas V. Santulli, described the phenomenon of hyperammonemia in some patients provided total intravenous nutrition. Drs. Eugene L. Klenk, Dell, and Winters are currently using the net acid balance technique in studying patients with chronic renal failure.

Dr. Calvin Sinnette was designated principal investigator of one of ten new national Sickle Cell Centers awarded by the National Heart and Lung Institute.

Dr. Carolyn D. Denning, in collaboration with Dr. Emile Scarpelli (Albert Einstein College of Medicine), was awarded a grant from the New York Metropolitan-Regional Medical Program for continuation of their work delivering comprehensive ambulatory pediatric pulmonary services in the community hospitals and health centers in Manhattan, the Bronx, and South Bronx. Dr. Carolyn R. Denning and Dr. William Davis were awarded a three-year grant to investigate the impact of pediatric pulmonary disease (asthma and cystic fibrosis) on patients and families by the Maternal and Child Health Service, HSHMA.

Drs. James Wolff and Anneliese Sitarz have been awarded support for studies of the treatment of leukemia and malignancy in children under the newly established Clinical Cancer Center of the Columbia-Presbyterian Medical Center.

Dr. Thomas A. Blumenfeld has begun studies directed at evaluating the cause(s) of Sudden Infant Death Syndrome. Dr. Blumenfeld is also studying phospholipids in tracheal and oropharyngeal fluids in newborn infants with RDS to determine levels of surfactant and metabolic intermediates.

Dr. Jo Anne Brasel is studying DNA polymerase activity measurements in cases of growth hormone deficiency, prenatal and postnatal malnutrition, and during "catch-up" growth following nutritional rehabilitation.

Drs. Robert B. Mellins, Frank Rodriguez-Martinez, and Armand Mascia have completed studies

at the Blythedale Children's Hospital on the effect of a change in ambient temperature on airway resistance in asthma. Dr. Mellins and Dr. Rodriguez have continued studies on the movement of fluid across the immature capillaries of the lung by evaluating the effect of atelectasis and hyperinflation on water movement. Drs. Mellins and Park have developed a non-invasive technique for the measurement of ventilation in infants and are studying the ventilatory response to CO_2 .

Dr. Akira Morishima, in collaboration with Dr. Sidney L. Horowitz (Dental and Oral Surgery), has initiated a systematic study of patients with cephalofacial and oral abnormalities. Drs. Morishima and Milstein, using a tissue culture system, have continued their investigation on the underlying mechanism leading to increased mitotic activity in heroin addicts. Drs. Bell and Frantz have initiated a study to elucidate the plasma levels of prolactin in children at various ages and in patients with various endocrine disorders during childhood and adolescence.

The Division of Ambulatory Care initiated a variety of studies including: a study of the frequency of broken appointments in the Pediatric Clinic; a study of parental understanding of physicians and prescriptions, and the influence of the pharmacist in patient compliance in drug therapy; a study of various aspects of the use of the Tine Test as a screening device; a study of the psychogenic factors involved in the presenting complaint of chest pain; and a study of three different antibiotic agents in the treatment of streptococcal pharyngitis.

A grant was awarded to Dr. Cyril Abrams by the National Institute of Mental Health for research on chromosomal damage in newborn infants of heroin addicted mothers.

Dr. Ruth Harris has initiated a study of cholestasis in newborn lambs with compromise of the hepatic artery supply; Drs. Harris and Winick have started a study on the effect of change of environment as an influence on malnourished orphans.

Acknowledgments

The Department of Pediatrics gratefully acknowledges the contributions of the many individuals and organizations that have supported its efforts in patient care, teaching, and research during 1972. Among these donors were: Abbott Laboratories; The Kidney Foundation of New York; The London Company; Mead Johnson Laboratories; Dr. Samuel Dunaif; royalties contributed by Drs. Dell, Engle, and Winters; Dr. William C. Heird; Mr. Richard Bausch, Jr.; Mr. Stuart Betts; Dr. and Mrs. Keith Custer; Mrs. Gertrude M. Garrett; Mr. and Mrs. Charles Hallock; Mr. and Mrs. Arnold Kossoff; Maplewood Junior Woman's Club; Mr. Bernard Peyton, III; Mr. Harry M. Rankin; Anne S. Richardson Fund-Chemical Bank; Jack S. Rosenberg Memorial Fund-Manhattan Chapter of the National Cystic Fibrosis Research Foundation; Mr. and Mrs. Arthur Silver; Mr. and Mrs. Howell Tuttle; Mrs. Jessie Wilson; Matheson Foundation; The Health Research Council of the City of New York; Mr. and Mrs. Aaron Rubin; The United States Public Health Service; The Albert H. and Jessie D. Wiggin Foundation; United Cerebral Palsy; National Institutes of Health General Research Support Grant; National Institute of Child Health and Human Development; The Milton Singer Memorial Fund; Mr. and Mrs. John Weir; Loretta Park School; Miss Adele Auchincloss; Parents and Friends of Exceptional Children; Ross Laboratories; Babies Hospital Alumni Association; Hoffman La-Roche; Virginia and D. K. Ludwig Foundation; Mr. Raphael Recanati; Cinergy Corporation; Olympic Surgical Co.; Bradford Computer and Systems, Inc.; The Upjohn Co.; Lederle Laboratories; Mrs. Dorothy Gillette; Mrs. Joseph V. McMullan; Mr. E. Robert Roskind; Dr. Peter J. Puchner; Dr. Alvin B. Hill; Mr. Edward Trueger; Mr. and Mrs. Norman Freeberg; Mr. and Mrs. Michael Weideger; Mr. and Mrs. Thomas McNulty; Mr. and Mrs. Marvin Belkin; Mrs. Louis L. Burton; New York Fund for Children, Inc.; Stanley L. and Harriet G. Sloane; Memorial Funds in memory of John Aritingi, Melissa Chase, Cynthia Carr, Hope Gottesman, Jeanne Durney, Michael Moro, Samuel Wexler, and Dawn Saracco.

1972 Publications

Pediatrics

- Behrman, Richard E.
Hyaline membrane disease: A discussion. *J. Pediat.* **80**:120-140, Jan. 1972.
- Brasel, Jo Anne
Age dependent differences in DNA polymerase activity following uninephrectomy in rats. *Growth*. **36**:45-58, 1972.
- Brasel, Jo Anne and Winick, Myron
Maternal nutrition and prenatal growth. *Arch. Dis. Child.* **47**:479-485, 1972.
- Cannon, P. J.; Dell, R. B. and Dwyer, E. M.
Measurement of regional myocardial perfusion in man with ¹³³Xenon and a scintillation camera. *J. Clin. Invest.* **51**:964-977, 1972.
Regional myocardial perfusion rates in patients with coronary artery disease. *J. Clin. Invest.* **51**:978-994, 1972.
- Challenor, Bernard; Wicks, Judy; and Lythcott, George I.
Community Medicine: An evolving discipline. In: *Annals of Internal Medicine*, Vol. 76, pp. 689-695, 1972.
- Curnen, Edward C., Jr.
Picornaviruses, Coxsackie viruses, ECHO viruses. In: *Pediatrics*, 15th ed. Henry L. Barnett, ed. Appleton Century Crofts, New York, 1972.
- DeLand, E. C.; Winters, R. W.; Dell, R. B. and Zuckerman, A.
FLUIDMOD: A versatile CAI system for medical students. RAND Monograph p.-4790, RAND Corporation, Santa Monica, 1972.
- Dell, R. B.
In vivo CO₂ equilibration curve. *Chest*. **61**:3₈-5₈, 1972.
- Dell, R. B.; Lee, C. E. and Winters, R. W.
Influence of body composition on the *in vivo* response to acute hypercapnia. *Pediat. Res.* **5**:523-528, 1972.
- Dell, R. B. and Winters, R. W.
Acid-base effects of hypertonic sodium bicarbonate. *J. Pediat.* **80**:681-682, 1972.
Capillary blood sampling for acid-base determinations. Technique and validity Radiometer AS 48, Copenhagen, 1972.
- Denning, C. R.
Symposium on the comprehensive care of chronic lung diseases in children - Introduction. *Bull. N. Y. Acad. Med.* **48**:682-683, 1972.
- Driscoll, J. M., Jr.; Heird, W. C.; Schullinger, J. N.; Gongaware, R. D. and Winters, R. W.
Total intravenous alimentation in low birth weight infants: A preliminary report. *J. Pediat.* **81**:145-153, 1972.
- Evans, Hugh E.; Keller, Stephen and Mandl, Ines
Serum trypsin inhibitory capacity and the respiratory distress syndrome. *J. Pediat.* **81**:588-592, 1972.
- Evans, Hugh E.; Sampath, Angus C.; Douglass, Frances and Baki, Alphonse
Shigella bacteremia in a patient with sickle cell anemia. *Amer. J. Dis. Child.* **123**:238-239, 1972.
- Fisher, D. E.; Paton, J. B.; Peterson, E. N.; de Lannoy, C. W. and Behrman, R. E.
Umbilical blood flow, fetal oxygen consumption and placental diffusion clearance of antipyrine in the baboon. *Respiratory Physiology*. **15**:141-150, 1972.
- Gersony, W. M.; Duc, G. V.; Dell, R. B. and Sinclair, J. C.
Assessment of right to left shunts in respiratory distress syndrome. *Cardiovascular Research*. **6**:423-438, 1972.
- Glass, Leonard and Evans, Hugh E.
Narcotic withdrawal in newborn infants. *Amer. Fam. Physician*. **6**:75, 1972.
- Glass, Leonard; Rajegowda, B. K.; Kahn, Eric J. and Floyd, M. V.
Effects of heroin withdrawal on respiratory rate and acid-base status of the newborn. *New Engl. J. Med.* **286**:746, 1972.
- Hamilton, L. A. and Behrman, R. E.
Intra-amniotic infusion of bicarbonate in the treatment of human fetal acidosis. *Am. J. Obst. & Gynec.* **112**:834-847, March, 1972.
- Harris, Ruth C. and Johnson, Philip M.
Use of the Anger camera in evaluation of excretion of ¹³¹I Rose Bengal from the liver. *Pediat. Research*. **6**:377, 1972.
- Heird, W. C.; Dell, R. B.; Price, T. and Winters, R. W.
Osmotic effects of the infusion of THAM. *Pediat. Res.* **6**:495-503, 1972.
- Heird, W. C.; Driscoll, J. M., Jr.; Schullinger, J. N.; Gongaware, R. D. and Winters, R. W.
Total intravenous nutrition in low birth weight infants. *J. Pediat.* **81**:145-153, 1972.
- Heird, W. C.; Driscoll, J. M., Jr.; Schullinger, J. N.; Grebin, B. and Winters, R. W.
Intravenous alimentation in pediatric patients. *J. Pediat.* **80**:351-372, 1972.
- Heird, W. C.; Nicholson, J. F.; Driscoll, J. M.; Schullinger, J. N. and Winters, R. W.
Hyperammonemia resulting from intravenous alimentation using a mixture of synthetic L-amino acids: A preliminary report. *J. Pediat.* **81**:162-165, 1972.
- Hosmer, Marion E. and Sprunt, Katherine
Screening method for identification of infected infant following premature rupture of maternal membranes. *Pediat.* **49**:283-285, 1972.
- Huang, N. N. and Denning, C. R.
Drugs used for late intestinal complications, pp. 91-93, 1972. In: *Guide to Drug Therapy in Patients with Cystic Fibrosis*. N. N. Huang, ed. National Cystic Fibrosis Research Foundation, 1972.

- Huang, N. N.; Holsclaw, D.; Hilman, B. C. and Denning, C. R.
Dietary care. pp. 55-60, 1972. In: *Guide to Drug Therapy in Patients with Cystic Fibrosis*. N. N. Huang, ed. National Cystic Fibrosis Research Foundation, 1972.
- Kildeberg, P. A. and Winters, R. W.
Infant feeding and blood acid-base status. *Pediat.* 49:801-802, 1972.
- Klenk, E. L.; Gaultney, J. V. and Bass, J. W.
Bacteriologically proved pertussis and adenovirus infection. *Amer. J. Dis. Child.* 124:203-207, 1972.
- Klenk, E. L. and Winters, R. W.
Parenteral fluid therapy in children. In: *Current Therapy*. pp. 428-433. H. E. Conn, ed. W. B. Saunders & Co., Philadelphia, 1972.
- Krongrad, Ehud and Joos, H. A.
Friedrich's ataxia in childhood: Case report with myocardial infarction, cerebrovascular thromboembolization and persistent elevation of cardiac specific LDH. *Chest.* 61:644, 1972.
- Krongrad, Ehud; Ritter, D. G.; Weidman, W. H.; McGoon, D. C. and DuShane, J. W.
Long term prognosis for patients with total correction of ventricular septal defect in infancy. *Circulation Supp.* II-178 (1972) Abstract 45 Scientific Sessions of the American Heart Association, November, 1972.
- Krongrad, Ehud; Waldo, A. L.; Bowman, F. O., Jr.; Hoffman, B. F. and Malm, J. R.
The electrophysiological delineation of the specialized A-V conduction system during open heart surgery for congenital heart disease. Abstract and Program, 41st Annual meeting, American Academy of Pediatrics. New York, N. Y. Oct., 1972.
- Kupersmith, J.; Waldo, A. L.; Krongrad, E.; Kaiser, J. R.; Malm, J. R. and Hoffman, B. F.
Conduction times and velocities in the His-Purkinje system of man-Studies during open heart surgery. Presented at the 56th annual meeting of the Federation of American Societies for Experimental Biology. Atlantic City, N. J. April 9-14, 1972.
- Lorin, M. I.; Denning, C. R. and Mandel, I. D.
Viscosity of exocrine secretions in cystic fibrosis: Sweat, duodenal fluid, and submaxillary saliva. *Biorheology.* 9:27-32, 1972.
- Lorin, M. I.; Gaerlan, P. F. and Mandel, I. D.
Quantitative composition of nasal secretions in normal subjects. *J. Lab. Clin. Med.* 80:275-281, 1972.
- Lynchott, George I.
The changing role of medical schools in the 70's and beyond. *P&S Quarterly*, Columbia University, College of Physicians and Surgeons, Vol. 4, No. 4, 1972. (Commencement Address to 1972 P&S Graduating Class).
- Malm, J. R.; Bowman, F. O., Jr.; Jesse, M. J.; Hayes, C. J.; Steeg, C. N. and Gersony, W. M.
Technics in management of infants requiring cardiopulmonary bypass. In: *Congenital Cardiac Defects: Recent Advances*. Williams & Wilkins, Baltimore 1972.
- Maurer, Harold M.; Wolff, James A.; Buckingham, Sue and Spielvogel, Arthur R.
"Impotent" platelets in Albinos with prolonged bleeding times. *Blood.* 39:490-499, 1972.
- Mellins, R. B.; Chernick, V.; Doershuk, C. F.; Downs, J. J.; Sinclair, J. C. and Waring, W. W.
Respiratory care in infants and children. *Amer. Rev. Resp. Dis.* 105:461-483, 1972.
- Mellins, Robert B.; Levine, Robert O.; Wigger, H. J.; Leidy, Grace and Curnen, Edward C.
Experimental meningococcemia: model of overwhelming infection in unanesthetized monkeys. *J. Applied Physiology.* 32:309-314, 1972.
- Moore, Thomas J.; Lione, A. P.; Regen, D. M.; Tarpley, H. L. and Raines, P. L.
Brain glucose metabolism in the newborn rat. *Am. J. Physiol.* 221:1746-1753, 1971.
- Nicholson, J. F. and Freeman, J. M.
The metabolism of compounds labeled with ¹⁵N by an infant with congenital hyperammonemia. *Pediat. Res.* 6:252-260, 1972.
- Prudent, L. M. and Driscoll, J. M., Jr.
Oxygen therapy for premature infants: A different approach. *J. Pediat.* 80:314-316, 1972.
- Rajegowda, B. K.; Glass, L. and Evans, H. E.
Lead concentration in the newborn. *Pediat.* 80:116, 1972.
- Rajegowda, B. K.; Glass, L.; Swartz, D. P. and Leblanc, W.
Methadone withdrawal in newborn infants. *J. Pediat.* 81:532, 1972.
- Schruefer, J. J.; Seeds, E. A.; Behrman, R. E.; Hellegers, A. E. and Bruns, P. D.
Changes in amniotic fluid volume and total solute concentration in the rhesus monkey following replacement with distilled water. *Am. J. Obst. and Gynec.* 112:807, March 15, 1972.
- Shah, S. I.; Alderman, M.; Queenen, J. T.; Brasel, J. A. and Winick, M.
Nondialyzable peptide-bound hydroxyproline in human amniotic fluid: An indicator of fetal growth. *Am. J. Obst. & Gynec.* 114:250-254, 1972.
- Shane, Louis L.; Marler, Eric and Bauman, William A.
Computer simulation of medical logic in clinical decision support system. *New York State J. of Med.* pp. 1636-1644, June 15, 1972.
- Sinnette, Calvin H.
An African pediatric narrative. *J. National Med. Assoc.* 64:43, 1972.
- Smith, F. R.; Underwood, B. A.; Denning, C. R.; Varma, A. and Goodman, D. S.
Depressed plasma retinol-binding protein levels in cystic fibrosis. *J. Lab. Clin. Med.* 80:423-433, 1972.
- Sokal, M.; Koenigsberger, M. R.; Rose, J. S.; Berdon, W. E. and Santulli, T. V.
Neonatal hypermagnesemia and the meconium-plug syndrome. *New England J. of Med.* 286:823-825 1972.

- Sprunt, Katherine
Infection in children with chronic lung disease. *Drug Therapy*. 2:47-49, 1972.
Infection in chronic lung disease. *Bull. N. Y. Acad. Med.* 48:698-703, 1972.
- Sprunt, K.; Leidy, G. A. and Redman, W.
Antibacterial effectiveness of routine handwashing. *Pediat. Res.* 6:125, 1972.
- Steeg, C. N.; King, D. L. and Ellis, K.
Cardiac ultrasonography, a new stop-motion technique: Application in the demonstration of transposition of the great vessels. *Pediat. Res.* 6:343, April 1972. 42nd Meeting Society for Pediatric Research, Washington, D. C. 1972.
- Underwood, B. A. and Denning, C. R.
Blood and liver concentrations of vitamins A and E in children with cystic fibrosis of the pancreas. *Pediat. Res.* 6:26-31, 1972.
- Velasco, E.; Brasel, J. A. and Winick, M.
Cellular growth of placenta and fetus during prenatal undernutrition. In: Western Hemisphere Nutrition Congress III. Miami Beach, 1971. Proc. Mt. Kisco, N. Y., Futura Publishing, 1972.
- Waldo, A. L.; Krongrad, E.; Bowman, F. O., Jr.; Kaiser, G. A.; Husson, G. S. and Malm, J. R.
Electrophysiological considerations during total repair of transposition of the great vessels. *Circulation Supp.* II-34 (1972). Abstract and program, U. S. scientific sessions of the American Heart Association, November, 1972.
- Williams, T. F. and Winters, R. W.
Familial (hereditary) vitamin D-resistant rickets with hypophosphatemia. In: *Metabolic Basis of Inherited Disease*. J. B. Stanbury, J. B. Wyngaarden, and D. Fredrickson, eds. Third Edition. pp. 1465-1485. McGraw Hill Co., New York, 1972.
- Winick, M.
Neurological correlations of malnutrition in animals and man. In: *Nutrition, Growth and Development of Native American Children*. W. M. Moore, M. M. Silverberg, and M. S. Read, eds. Govt. Printing Office, Washington, D. C. 1972.
- Nutrition and the growing fetus. *Medical World News: Obst. and Gynec.*, pp. 47-49, 1972.
- Nutrition, development and the physician's responsibility. *Pediatric Basics* (Gerber Products Co.). 5:10-12, 1972.
- Winick, M.; Brasel, J. A. and Rosso, P.
Nutrition and cell growth. In: *Nutrition and Development*, Vol. I., M. Winick, ed. John Wiley, New York, 1972.
- Winick, M. and Coombs, J.
Nutrition, environment and behavioral development. *Ann. Rev. Med.* 23:149-160, 1972.
- Winick, M.; Rosso, P. and Brasel, J. A.
Malnutrition and cellular growth in the brain: Existence of critical periods. In: *Ciba and Nestle Foundations' Joint Symposium on Lipids and Developing Brain, London, 1971*. Proc., Amsterdam, Associated Scientific Publishers, 1972.
- Winters, R. W.
Terminology of acid-base disorders. Proc. of the 14th Aspen Emphysema Conference. *Chest*. 61:1s-3s, 1972.
- Wolff, James A.
Acute leukemia in children. In: *Clinics in Haematology*. W. B. Saunders Co., London, 1972.
- The leukemias in childhood. In: *Brennemann's Practice of Pediatrics*, Vol. III, Chapter 66. Harper & Row Publishers, Inc., Hagerstown, Md., 1972.
- Zuckerman, A.; DeLand, E. C.; Dell, R. B. and Winters, R. W.
FLUIDMOD: A program for a computer based instruction in clinical fluid therapy. RAND Monogram P-4799, RAND Corporation, Santa Monica, 1972.

Pharmacology

BRIAN F. HOFFMAN

Hosack Professor and Chairman of the Department • Pharmacologist

During the year the department made several changes in instruction for medical and dental students. Many of the traditional laboratories and demonstrations were replaced with new forms of instruction which allowed greater interaction between faculty and students. Dr. Norman Kahn, Dr. J. Thomas Bigger, Jr., (Medicine) and Mr. Meir Florenz developed a computer assisted demonstration in pharmacokinetics which permits the students and faculty to test the effects of ten variables on blood levels of different drugs administered by different routes and by different dosing schedules. These programs have been used in a variety of educational exercises for medical and dental students and for the house staff and attending physicians at the Presbyterian Hospital. Dr. Kahn also introduced the use of recordings of responses to drugs on magnetic tape for a number of student demonstrations. The method allows the student and instructor to examine any group of drug responses in any sequence. The use of the tape recorder permits maximum interaction between the participants and the demonstrator since appropriate responses to drugs can be replayed in the context of the discussion. The same tape can be used for demonstrations in future years, saving both faculty time and animal life and reducing cost of instruction. A third new format introduced was the "Case Conference." The purpose of these exercises is to teach basic and clinical pharmacology in the context of clinical case presentations.

Because of the need to improve instruction, re-

search and training in clinical pharmacology the department formed a Division of Clinical Pharmacology under the direction of Drs. Kahn and Bigger. This division will include faculty members with interdisciplinary appointments between Pharmacology and several of the clinical departments. For its first program of formal instruction in the field of clinical pharmacology the department joined with the Department of Medicine in a new seminar series "The Clinical Pharmacology of Cardioactive Agents." The series, arranged by Drs. Bigger and Kahn, was held in conjunction with the cardiorespiratory conferences and provided an educational experience for medical students, house staff and attending physicians. The department also progressed with its plans for increased emphasis on instruction and research in psychopharmacology. Programs in this area will be the responsibility of Dr. Lance L. Simpson who was appointed Assistant Professor of Pharmacology and Psychiatry. During the year Dr. Simpson held the first of a series of courses in postgraduate medicine. The course for 1972 was entitled "The Use of Psychotherapeutic Drugs in the Treatment of Mental Illness".

During the year Dr. Hsueh-Hwa Wang was promoted to Associate Professor with tenure, Dr. Kahn was promoted to the rank of Associate Professor and Dr. Edward B. Kirsten was promoted to Assistant Professor. Dr. Martin M. Winbury was appointed Adjunct Assistant Professor and Dr. Peter K. T. Pang was appointed Instructor. Dr. Klaus Pleshka, Associate member at the W. G.

Kerchoff Institut of the Max Planck Gesellschaft in Bad Nauheim, Germany, was appointed Visiting Associate Professor; Dr. Pleshka will work with Dr. S. C. Wang in his studies in neuropharmacology. Dr. Elsa Grace Giardina was appointed Instructor in Medicine (Clinical Pharmacology). Dr. Shigeharu Nagasawa, from the Institute of Protein Research in Osaka, Japan, was appointed Visiting Instructor to work with Dr. Greenbaum in his studies on leukokinins and Dr. Toru Niinaka was appointed Visiting Research Associate to work with Dr. Greenbaum and Drs. Saul Sanders and Jack Eisert (Dermatology) in their studies on the causes and treatment of psoriasis.

Dr. Kirsten was granted a Research Career Development Award from the National Institute of General Medical Science for studies on the physiology of motion-sensitive neurons and Dr. Michael Rosen was awarded a Senior Investigatorship by the New York Heart Association. Dr. Elizabeth E. Le Bourhis was awarded a fellowship in reproductive physiology by the Lalor Foundation and Dr. Andrew L. Wit and Dr. Kirsten were awarded fellowships by the John Polachek Foundation. Dr. Albert L. Waldo left the department to become Associate Professor of Medicine at the University of Alabama in Birmingham and Dr. Harold C. Strauss left to become Assistant Professor of Medicine at the Duke University Medical Center. Dr. Björn Lisander completed his research with Dr. S. C. Wang and returned to the University of Göteborg in Sweden. Dr. Herbert J. Bartelstone resigned as Associate Dean and Director of Clinical Education for the School of Dental and Oral Surgery. Dr. S. C. Wang was granted sabbatical leave to work with Dr. K. Bucher at the Pharmacological Institute Biozentrum of the University of Basel in Switzerland. During the summer he visited Taiwan and made a survey on the effectiveness of acupuncture induced analgesia.

The graduate training program of the department continued to flourish. Four students, Stephanie April, Peter Chiu, Kenneth Hirsh, and Sadhana Sathe, completed their graduate studies and were awarded the Ph.D. degree. Dr. April is now postdoctoral fellow in immunochemistry with Dr. Vincent P. Butler (Medicine). Dr. Chiu is a postdoctoral fellow in the nephrology division of the Department of Medicine at the University of Pennsylvania School of Medicine and is continuing his studies in renal physiology. Dr. Hirsh has joined the General Foods Corporation where he is Senior Pharmacologist. Dr. Sathe is with the Schering Corporation of Bloomfield, New Jersey, as Assistant

Director for Medical Development.

Four new students, Gracella Albury, Hrayr Karagueuzian, Eric Spokas and Mildred Yang, were admitted as candidates for the Ph.D. degree. John Gorham Palfry, Jr., who is enrolled in the Medical Scientist Training Program, also was admitted as a Ph.D. candidate in pharmacology. Continuing their studies were Ardith Bondi, Kenneth Dangman, Peter Danilo, Jr., Diana Gazis, Marjorie Geller, Hsheng-kai Lee, Mitchell Leibowitz, Hreday Sapru, and Jay Wiggins. New postdoctoral fellows with the department include Dr. Joel Kupersmith, Alan L. Saroff and F. James Brennan. In addition, the appointments of Drs. Ronald J. Aronson, Jeremiah M. Gelles, Martha M. Johnston, Ajai Prakash, Eugene Schoener and Francis M. Weld were renewed.

Research

Dr. Sawyer and Dr. Jang are studying the control of calcium balance in euryhaline fishes and the influences of calcium concentrations in the external environment and hormones of the pituitary gland and the corpuscles of Stannius on plasma calcium levels. They also are using isotopic flux methods to measure sodium exchanges by several species of fishes, with particular attention to the effects of prolactin and neurohypophysial hormones. Dr. Pang has collaborated with Dr. Martin P. Schreibman and Dr. Robert W. Griffith (Reserach Associate, Bingham Laboratory of Yale University), in some of these studies. With Dr. Sawyer, Dr. Nishimura continued her studies on the phyletic distribution of the various components of the renin-angiotensin system among primitive fishes, including the coelacanth. In these studies she is collaborating with Dr. Mizuho Ogawa of Saitama University, Japan. She is also investigating the possible functions of this system in fishes by following its activity as related to changes in external salinity, plasma volume, sodium balance, and cortical secretion. Dr. Sawyer and Mrs. Margot Acosta continued to investigate the biological properties of naturally occurring neurohypophysial peptides and synthetic structural analogues. They are collaborating with several synthetic chemists and in particular with Dr. Maurice Manning of the Medical College of Ohio who has prepared a large number of new peptides for these studies.

Dr. Greenbaum continued his collaboration with Dr. Martha Johnston, recipient of a Smith, Kline & French Fellowship, and Dr. Ajai Prakash, USPHS Fellow, in studies concerned with ascites fluid formation in neoplastic diseases. These in-

vestigations have demonstrated the presence of a newly discovered group of pharmacologically active peptides which Dr. Greenbaum has termed leukokinins. Dr. Nagasawa, Visiting Instructor from the Institute of Protein Research in Osaka, Japan, also is collaborating with Dr. Greenbaum in studies on the substrate from which leukokinins are derived. Mr. Mitchell Leibowitz, a graduate student has been working with Dr. Greenbaum and Dr. H. H. Wang in studies on the effect of hypovolemic shock on the response of the systemic vasculature to chemical mediators such as angiotensin and bradykinin.

Dr. Simpson continues to conduct research on the physiology and pathophysiology of synaptic transmission. Two problems are presently under study. In the first, an effort is being made to unravel the mechanism of action of botulinum toxin. In the second, attention is being directed at the possible role of catecholamines in hypertension. Dr. Le Bourhis and Dr. F.G. Hofmann are continuing their studies on steroid hormone biosynthesis. They have been examining the role of various intracellular factors in determining whether Δ^5 or Δ^4 pathways are utilized in steroid synthesis. They also are continuing their studies on the influence of adrenocortical steroidogenesis on fetal sexual differentiation. Alterations in corticosteroid production in the guinea pig are being utilized to simulate the various types of congenital adrenal hyperplasia observed in humans.

Dr. Arthur Bassett continued to study the electromechanical properties of normal and diseased canine mitral valve in collaboration with Dr. Wit and Drs. John Fenoglio and Bernard Wagner of the Department of Pathology. Dr. Bassett and Mr. Jay Wiggins, graduate student in pharmacology, have studied the effects of KCl on contracture in cardiac muscle. With Dr. B.F. Hoffman, Dr. Bassett has further characterized the effects of AY 22,241, a cardiotonic steroid, on cardiac contraction. Dr. Wit, in collaboration with Mr. Peter L. Friedman, a Medical Scientist Candidate, and Dr. F. James Brennan, has conducted a series of studies on the cellular electrophysiologic mechanisms underlying the cardiac arrhythmias associated with myocardial infarction. Dr. Wit has also continued his collaboration with Dr. Cranfield at the Rockefeller University, in studies on the relationship of a slow depolarizing current in cardiac muscle to the occurrence of reentrant arrhythmias.

Dr. Kirsten and Dr. Schoener are continuing their studies on the local anesthetic activity of belladonna alkaloids and the effects of dextro-amphetamines on motion-sensitive vestibular neurons

in cats. Miss Ardith Bondi, a graduate student working with Dr. Kirsten, has succeeded in recording intracellular activity from the vestibular nucleus of a stereotactically mounted cat during continuous motion. Dr. Kirsten and Miss Karen Lustig are studying the effects of a muscle relaxant (AHR-2666) on frog sartorius muscle. Dr. Schoener has continued his examination of pyretic-antipyretic mechanisms located in the anterior hypothalamus. He is currently attempting to characterize the effects and interactions of locally applied pyrogen and prostaglandins and aspirin on the activity of single thermosensitive hypothalamic neurons. Dr. H.H. Wang has studied the effect of a number of vasodilating drugs on canine arterial smooth muscle from different vascular beds and from different segments of these beds and, in collaboration with Dr. Ronald L. Katz (Anesthesiology) is now studying the effects of different "depressor" drugs on arterial hemodynamics and the redistribution of regional blood flow.

Drs. Bigger, Giardina (Medicine), Robert A. Heissenbuttel (Medicine) and Saroff are conducting a number of studies on the clinical pharmacology of cardioactive drugs. This year they have focused on procaine amide and lidocaine emphasizing their pharmacodynamics, the effect of procaine amide and lidocaine on ventricular reentrant circuits in man, the altered handling and incidence of minor toxicity of lidocaine in acute myocardial infarction in humans and the efficacy of a special formulation of intramuscular lidocaine in producing and maintaining plasma drug concentrations and arrhythmia control.

Drs. Morton F. Arnsdorf (Air Force, Anchorage, Alaska) and Dr. Bigger completed a study showing that lidocaine increases potassium conductance in mammalian cardiac Purkinje fibers to a degree sufficient to explain its ability to suppress automaticity in this fiber type. Dr. Weld and Dr. Bigger have studied the effects of procaine amide on membrane potassium conductance in mammalian cardiac Purkinje fibers and found that although procaine amide, like lidocaine, suppresses automaticity in these fibers it does not increase membrane potassium conductance. Drs. Bigger and Giardina, in collaboration with Drs. J. Dreyfuss and E. Schreiber (Squibb Institute of Medical Research) found that hepatic metabolism is a significant factor in terminating the pharmacologic action of procaine amide.

Dr. Bjorn Lisander, working with Dr. S. C. Wang, completed studies on the site in the central nervous system at which diphenylhydantoin acts on arrhythmias induced by hypothalamic stimulation. It was

found that when this agent was injected into the vertebral artery or administered topically on the floor of the fourth ventricle, the dose required to prevent the arrhythmias is only 1/10 of that required for intravenous injection. Kenneth Hirsh, working with Dr. S. C. Wang, completed requirements for the Ph.D. degree and stayed on as a postdoctoral fellow. He completed a study on several respiratory stimulants and found that doxapram stimulates respiration by an action on the carotid bodies.

Dr. Rosen and Dr. Robert M. Weiss, Associate Professor of Surgery (Urology) at Yale University, continued their studies on the electrophysiological properties of mouse neuroblastoma cells in tissue culture. Dr. Rosen and Dr. Charles Merker (Surgery) investigated the relationships between blood levels of procaine amide and lidocaine and the effects of these drugs on the transmembrane potentials of single canine cardiac Purkinje fibers and ventricular muscle fibers. With Dr. B. F. Hoffman and Mr. Jerry Glicklich, a Medical Scientist Candidate, Dr. Rosen studied the effects of a new cardiotonic steroid, AY 22,241, on the electrocardiogram and the electrical activity of single cardiac fibers. Mr. Peter Danilo a graduate student working with Dr. Rosen and Dr. B. F. Hoffman, initiated studies on the effects of cyclic adenosine monophosphate on the electrical activity of cardiac fibers and the role of this chemical in mediation of the effects of catecholamines on cardiac electrical activity.

Dr. Aronson and Dr. Gelles, working with Dr. B. F. Hoffman, have developed a new method for producing short segments of cardiac Purkinje fibers suitable for study by means of voltage-clamp techniques. Using these methods they have studied the slow changes in ionic conductance of the cardiac fiber membrane and the effects thereon of a variety of cardiac drugs. Mr. Glicklich and Dr. B. F. Hoffman have begun studies on the transmembrane ionic currents thought to be responsible for slowly propagating action potentials in the mammalian heart. Dr. Sadhana Sathe, a graduate student who completed the requirements for the Ph.D. degree, and Dr. B. F. Hoffman completed studies on mechanisms thought to be responsible for desensitization of cholinergic receptors by cholinomimetic drugs.

Dr. Kupersmith, Dr. Sarnoff and Dr. B. F. Hoffman, with Dr. Krongrad (Pediatrics) and Drs. James R. Malm and Frederick O. Bowman, Jr., (Surgery) have continued their studies on the electrophysiology of the human heart and the causes and treatment of conduction disturbances and arrhythmias. This work has provided new means

to identify the anatomical location of specialized structures in the human heart so that they will not be compromised by surgical interventions and had provided new understanding of the mechanisms responsible for abnormalities of impulse generation and conduction.

Activities

Dr. F. G. Hofmann continued to serve as Associate Dean for Admissions for the College of Physicians and Surgeons. He continues as a member of the Publications Committee of the Endocrine Society and the Editorial Boards of *Endocrinology* and *Proceedings of the Society of Experimental Biology and Medicine*. During the year he attended the International Congress of Endocrinology in Washington, D.C. and was an invited participant in the Macy Foundation-Rockefeller University Joint Conference on "Instruction in the Problems of Drug Abuse". Dr. Greenbaum continues as Director of Graduate Studies for the department and was appointed to represent the department on the Curriculum Committee. He continues to serve as a member of the Public Affairs Committee of the American Society for Pharmacology and Experimental Therapeutics and was appointed a member of its National Committee on Non-Medical Use of Drugs. Dr. Greenbaum also served as a member of the Program Committee which organized the first Annual Meeting of the American College of Clinical Pharmacology. Dr. Greenbaum presented the results of his search at the Symposium on Protides in Brugge, Belgium.

Dr. Wilbur H. Sawyer continues to serve on the General Medicine B Study Section, Division of Research Grants, N.I.H. and on the Editorial Boards of *Endocrinology* and the *Journal of General and Comparative Endocrinology*. He also served briefly as Visiting Professor of Physiology at the Medical Schools of the Universities of New Mexico and Arizona. He continues to serve on the Supervisory Committee and as Chairman of the Admissions Committee of the Medical Scientist Training Program, on the Faculty Council and its Committee on Appointments and Promotions. He was also elected to the Executive Committee of the Faculty Council. Dr. Hiroko Nishimura and Dr. Sawyer reported on their work at the V International Congress of Pharmacology, San Francisco and the V International Congress of Nephrology, Mexico City. Dr. Pang and Dr. Sawyer presented papers at the IV International Congress of Endocrinology, Washington, D.C. where Dr. Sawyer also served as chairman of a session on the neurohypophysis.

Dr. Pang was co-organizer, with Dr. Martin Schreiber (Associate Professor of Biology, Brooklyn College) of a two day symposium on "The Current Status of Fish Endocrinology" sponsored by the American Society of Zoologists Division of Comparative Endocrinology at the Annual Meeting of the American Association for the Advancement of Science.

Dr. Kahn continued to serve as course director for the course in pharmacology for medical and dental students. He attended the Symposium on Teaching of Pharmacology and Toxicology in Medical Schools and Health Science Centers held in conjunction with the International Pharmacology Congress held in San Francisco in July, 1972. Dr. Kahn continued to serve on the Editorial Advisory Board of *Neuropharmacology* and as Consulting Pharmacologist to the Formulary Committee of the Harlem Hospital.

During the year Dr. Bigger was appointed to the Editorial Board of *Circulation* and the Pharmacology A Study Section of the Institute of General Medical Sciences, NIH. Dr. Kirsten was elected to membership in the Society of General Physiologists. Dr. Wit continued to serve as Adjunct Assistant Professor at the Rockefeller University and was invited to deliver the annual lecture before the

Physiological Society of Philadelphia. Dr. B. F. Hoffman continued to serve as Director of the Medical Scientist Training Program at the College of Physicians & Surgeons and as a member of the Special Program Committee of the National Heart and Lung Institute. Dr. Hoffman and Dr. Bigger organized a special course for cardiologists held under the auspices of the New York Heart Association and entitled "Pharmacologic Basis of Cardiovascular Therapy". During the year Dr. Hoffman was awarded the Alumni Medal for Distinguished Service to American Medicine by the Downstate Medical Center of the State University of New York. Dr. Hoffman and Dr. Paul F. Crane field spoke at a symposium on "Recent Advances in Cardiac Arrhythmias" in Amsterdam honoring the opening of the new cardiac hospital of the Wilhelmina Gasthuis. Dr. Hoffman was appointed chairman of the committee on the Louisa Gross Horwitz prize and continues to serve as a member of the Advisory Council for Research of the New York Heart Association and as an Adjunct Professor in the Rockefeller University. Dr. Crane field continues to serve as Editor of the *Journal of General Physiology* and as a member of the editorial boards of *Circulation Research* and the *Journal of Electrocardiography*.

1972 Publications

Pharmacology

Arnsdorf, Morton F. and Bigger, J. Thomas, Jr.

Effects of lidocaine on excitability of cardiac Purkinje fibers. *Fed. Proc.* 31:524, 1972.

Effect of lidocaine on membrane current voltage relationships in cardiac Purkinje fibers. *Circulation* 44, Suppl. II:136, 1971.

The effect of lidocaine hydrochloride on membrane conductance in mammalian cardiac Purkinje fibers. *J. Clin. Invest.* 51:2252-2263, 1972.

Bassett, A. L. and Gelband, H.

Altered action potential plateau during early stage of experimentally induced ventricular hypertrophy. *Fed. Proc.* 31:387, 1972.

Electromechanical properties of myocardium during development of hypertrophy and failure. *Abstracts 5th Annual Meeting International Study Group for Cardiac Metabolism*. p. 46, 1972.

Bassett, A. L. Gelband, H.; Bartelstone, H. J. and Hoffman, B. F.

Improvement of atrial contractility by hyperpolarizing drugs. *Fifth International Congress on Pharmacology, Abstracts of Volunteer Papers*, p. 16, 1972.

Beach, P. M., Jr., Bowman, F. O., Jr.; Kaiser, G. A.; Parodi, E. and Malm, J. R.

Aortic valve replacement with frozen irradiated homografts. *Circulation Suppl.* 45:1-29, 1972.

Biancani, P.; Weiss, R. M.; Zabinski, M. and Bassett, A. L.

Pressure-length-diameter relationships of rabbit ureter. *The Physiologist*, 15:87, 1972.

Bigger, J. Thomas, Jr.

Antiarrhythmic drugs. In: *Cardiovascular Drug Manual*, W. B. Abrams, G. N. Gold, editors, New Jersey Regional Medical Program, Orange, 1972.

Arrhythmias and antiarrhythmic drugs. In: *Advances in Internal Medicine*, G. H. Stollerman, editor, Year Book Medical Publishers, Inc., Chicago, 1972.

Bigger, J. Thomas, Jr. and Strauss, Harold C.

Digitalis toxicity: Drug interactions promoting toxicity and the management of toxicity. *Seminars in Drug Treatment*. 2:147-177, 1972.

Bokkenheuser, V.; Kelly, W. G. and Suzuki, J. B.

Alterations of hormones by bacterial flora of the intestinal tract. *In vitro* formation of pregnanolone from deoxycorticosterone. *Abstracts of the Annual Meeting of the American Society for Microbiology*, 1972, p. 118.

- Brennan, F. J.; McCans, J. L.; Chiong, M. A. and Parker, J. O.
Effects of ouabain on myocardial potassium and sodium balance in man. *Circulation* **45**:107, 1972.
- Bush, H. L.; Gelband, H.; Hoffman, B. F. and Malm, J. R.
Electrophysiological basis for supraventricular arrhythmias following surgical procedure for aortic stenosis. *Arch. Surg.* **103**:620-624, 1972.
- Chai, C. Y.; Lin, M. T.; Chen, H. I. and Wang, S. C.
The site of action of leukocytic pyrogen and antipyresis of sodium acetylsalicylate in monkeys. *Neuropharmacology* **10**:715-723, 1971.
- Chiu, P. J. S. and Sawyer, W. H.
Natriuretic responses by cats to hypertonic saline injected into the third cerebral ventricle. *Fed. Proc.* **31**:585, 1972.
- Cohen, R. S.; Clark, N. B. and Pang, P. K. T.
Ultrastructure of the corpuscles of Stannius of the killifish, *Fundulus heteroclitus*, and its relation to calcium metabolism. *Amer. Zool.* 1972.
- Constantine, J. W.; MacShane, W. K. and Wang, S. C.
Comparison of carotid artery occlusion and tilt responses in dogs. *Am. J. Physiol.* **221**:1681-1685, 1972.
- Cranefield, P. F.; Hoffman, B. F. and Wit, A. L.
Block of conduction in partially depolarized cardiac Purkinje fibers induced by an α -adrenergic agent. *Nature New Biology*, **234**:159-160, 1971.
- Cranefield, P. F.; Wit, Andrew L. and Hoffman, B. F.
Conduction of the cardiac impulse. III. Characteristics of the very slow conduction. *J. Gen. Physiol.* **59**:227, 1972.
- Danilo, P.; LeBourhis, E. and Rosen, M.
Effects of dibutyryl 3'-5'-cyclic AMP on electrophysiologic properties of canine Purkinje fibers. *Fifth International Congress on Pharm.* p. 51, 1972.
- Dreyfuss, Jacques; Bigger, J. Thomas, Jr.;
Cohen, Allen I. and Schrieber, Eric C.
Metabolism of procaine amide in rhesus monkey and man. *Clin. Pharmacol. & Therap.* **13**:366-371, 1972.
- Dunson, W. A.; Buss, E. G.; Sawyer, W. H. and Sokol, H. W.
Hereditary polydipsia and polyuria in chickens. *Am. J. Physiol.* **222**:1167-1176, 1972.
- Engleman, E. and Greenbaum, L. M.
The kinin-forming activity of human lymphocytes. *Biochem. Pharmacol.* **20**:922, 1971.
- Fenoglio, J., Jr.; Pham, T. D.; Wit, A. L.; Bassett, A. L. and Wagner, B. M.
The canine mitral complex: Ultrastructural and electromechanical studies. *Circ. Res.* **31**:417-430, 1972.
- Friedman, Peter L.; Stewart, James; Hoffman, Brian F. and Wit, Andrew L.
Electrophysiological properties of Purkinje fibers surviving myocardial infarction. *Circulation* **46** (Suppl. II): 10, 1972.
- Friedman, Peter L.; Wit, Andrew L. and Hoffman, Brian F.
Experimental myocardial infarction: Alterations in electrophysiological properties of surviving cells. *Bull. N. Y. Acad. Med.* **48**:1037, 1972.
- Gelband, H.; Waldo, A. L.; Kaiser, G. A.; Bowman, F. O., Jr.; Malm, J. R. and Hoffman, B. F.
The etiology of right bundle branch block in patients undergoing total correction of tetralogy of Fallot. *Circulation* **44**:1022-1033, 1971.
- Gelband, H.; Bush, H.; Wigger, H.; Rosen, M.; Myerburg, R. and Hoffman, B. F.
Etiology of supraventricular arrhythmias following surgery for congenital aortic stenosis. *Proc. APS-SPR* **302**:1971.
- Gelband, H.; Rosen, M. and Hoffman, B. F.
Effects of digoxin on the electrophysiologic properties of canine Purkinje fibers utilizing a blood perfusion system. *Am. Acad. Ped. — Section on Pediatric Cardiology*, Oct. 1971.
- Gelband, H. and Bassett, A. L.
Electrophysiologic properties of atrial and ventricular muscle from cats with experimentally induced heart failure and hypertrophy. *Am. J. Cardiol.* **29**:265, 1972.
- Gelband, H.; Bassett, A. L. and Hoffman, B. F.
Effect of autonomic drugs on excitation and contraction in normal and depressed myocardium. *Pediatric Res.* **6**:342, #82, 1972.
- Gelband, Henry; Bush, Harry L.; Rosen, Michael R.; Myerburg, Robert J. and Hoffman, Brian F.
Electrophysiologic properties of isolated preparations of human atrial myocardium. *Circ. Res.* **30**:293-300, 1972.
- Giardina, E. G.; Bigger, J. T., Jr., Heissenbittel, R. and Yu, E.
Antiarrhythmic action of procaine amide on ventricular arrhythmias in man. *Circulation* **44** (Suppl. II):86, 1971.
- Greenbaum, L. M. and Nagasawa, S.
Substrates other than bradykinogen which release kinins. *The Pharmacologist* **13**, 1971.
- Greenbaum, L. M.
Cathepsins and kinin-forming and destroying enzymes. In: *The Enzymes*, P. Boyer (editor) Vol. III, 475, 1971. Academic Press, N. Y.
- Hirsh, K. and Wang, S. C.
Mechanism of specific respiratory stimulant action of doxapram. *Fed. Proc.* **31**:372, 1972.
- Hoffman, B. F.; Butler, V. P., Jr.; Gelband, H. and Rosen, M.
Effects of digoxin in the electrophysiologic properties of blood perfused canine Purkinje fibers. *Fed. Proc.* **30**:393, 1971.
- Hoffman, B. F.
Cardiac automaticity and A-V junctional rhythms. *Res. in Physiol.* Aulo Gaggi, Bologna, 1971.
- Hoo, S. L.; Lin, M. T.; Wei, R. D.; Chai, C. Y. and Wang, S. C.
Effects of sodium acetylsalicylate on the release of pyrogen from leukocytes. *Soc. Exp. Biol. & Med* **139**:1155-1158, 1972.

- Kelly, W. G. (Book Review)
Monographs on Endocrinology, Vol. 5. Regulation of Aldosterone Biosynthesis. Jurg Muller, Springer Verlag, New York. *Circulation* 46:414, 1972.
- Kirsten, Edward B. and Ross, Samuel M.
Electronic circuit for simulation of multiple dosing kinetics. *J. Pharmacol. Sci.* 61:1468-1470, 1972.
- Kirsten, E. B. and Schoener, E. P.
Antagonism of pentylene-tetrazol excitation by anti-convulsants on single brain stem neurons. *Neuro-pharmacology* 11: 591-599, 1972.
Perphenazine action on vestibular neurons. *European J. of Pharmacol.* 19:165-170, 1972.
- Kirsten, E. B.; Schoener, E. P. and Wang, S. C.
Effects of antinotion sickness agents on vestibular neuronal activity. *Fifth International Congress of Pharmacology*, p. 126, 1972.
- Klein, H. O.; Crane-field, P. F. and Hoffman, B. F.
Effect of extrasystoles on idioventricular rhythm *Circ. Res.* 30:651, 1972.
- Koss, M. C. and Wang, S. C.
Brain stem loci for sympathetic activation of the nictitating membrane and pupil in the cat. *Am. J. Physiol.* 222:900-905, 1972.
Effects of reserpine on centrally and peripherally evoked nictitating membrane responses in the cat *Am. J. Physiol.* 222:906-913, 1972.
- Krieger, A. J.; Christensen, H. D.; Sapru, H. N. and Wang, S. C.
Changes in ventilatory patterns after ablation of various respiratory feedback mechanisms. *J. Applied Physiol.* 33:431, 1972.
- Krongrad, Ehud; Waldo, A. L.; Bowman, F. O., Jr.; Hoffman, B. F. and Malm, J. R.
The electrophysiological delineation of the specialized A-V conduction system during open heart surgery for congenital heart disease: consideration of surgical and postoperative management. *Am. Acad. Ped.-Sec. of Ped. Cardiol.*, Oct. 1972.
- Kupersmith, J.; Waldo, A. L.; Krongrad, Ehud; Kaiser, J. R.; Malm, J. R. and Hoffman, B. F.
Conduction times and velocities in the His-Purkinje system of man — studies during open heart surgery Presented at the 56th Annual Meeting. *Fed. Proc* 31:313, 1972.
- LeBourhis, E. E.; Danilo, Peter and Hofmann, F. G.
Adrenocortical steroid biosynthesis in the guinea pig: Developmental aspects. *Fourth International Congress of Endocrinology*, Washington, 1972, Abstract #28.
- LeBourhis, E. E.; Bondi, A. Y. and Hofmann, F. G.
Cyclic adenosine monophosphate and related compounds: Effect on steroidogenesis in adrenal and testicular microsomes. *Fed. Proc.* 31:292, 1972.
- Mandel, William J.; Bigger, J. Thomas, Jr. and Butler, Vincent P., Jr.
The electrophysiologic effects of low and high digoxin concentrations on isolated mammalian cardiac tissue: reversal by digoxin-specific antibody. *J. Clin. Invest.* 51:1378-1387, 1972.
- Nishimura, H.; Ogawa, M. and Sawyer, W. H.
Evolution of the renin-angiotensin system and its possible functions in bony fishes. *Proc. 5th Int. Congr. Pharmacol.* 1972.
Studies on the distribution and evolution of the renin-angiotensin system and the juxtaglomerular apparatus among primitive bony fishes. *Fed. Proc.* 31:381, 1972.
- Nishimura, H.; Sawyer, W. H. and Nigrelli, R. F.
Effects of external salinity on renin activity, plasma volume and cortisol levels in a euryhaline teleost fish, the eel, *Anguilla rostrata*. *Proc. 5th Int. Congr. Nephrol.* 1972.
- Nosaka, S. and Wang, S. C.
Carotid sinus baroreceptor functions in the spontaneously hypertensive rat. *Am. J. Physiol.* 222:1079-1084, 1972.
- Ogawa, M. and Nishimura, H.
Juxtaglomerular apparatus in primitive bony fishes. *Zool. Maga.* 80:474, 1971.
- Ogawa, M.; Oguri, M.; Sokabe, H. and Nishimura, H.
Juxtaglomerular apparatus in the vertebrates. *Gen. Comp. Endocrin. Suppl.* 3:374-388, 1972.
- Pang, P. K. T.
Hormonal control of serum calcium levels in fish. *Proc. 4th Int. Congr. Endocrinol.* Abstracts, 182-183, 1972.
- Pang, P. K. T.; Griffith, R. W. and Kahn, N.
Electrolyte regulation in the fresh water stingrays (Potomotrygonidae). *Fed. Proc.* 31:244, 1972.
- Pang, P. K. T.; Griffith, R. W. and Schreiber, M. P.
The pituitary gland and calcium metabolism in *Fundulus diaphanus* (Teleostei). *Gen. Comp. Endocrinol.* 19: 1972.
- Parodi, E.; Kaiser, G. A.; Wolff, M.; Kovalik, A. T. W. and Malm, J. R.
Comparative study of the tensile strength of autogenous systemic veins and preserved venous homografts. *J. Surg. Res.* 12:09, 1972.
- Pliska, Vladimir; McKelvy, Jeffrey and Sachs, Howard
Electrofocusing and gel electrophoresis of bovine neurophysins. *European J. Biochem.* 28:110-115, 1972.
- Rosen, M.; Gelband, H. and Hoffman, B. F.
Canine electrocardiographic and cardiac electrophysiologic changes induced by procaine amide. *Circulation* 46:528-536, 1972.
Effect of blood perfusion on electrophysiologic properties of canine Purkinje fibers. *Fed. Proc.* 30:668, 1971.
Effect of plasma level of procaine amide on electrophysiologic properties of isolated canine cardiac Purkinje fibers. *The Pharmacologist* 13:181, 1971.
Effects of ouabain upon electrophysiologic properties of single cardiac cells and their electrocardiographic counterpart, *Circulation* 40 (Suppl. 2) 84, 1971.
- Rosen, M.; Merker, C.; Gelband, H. and Hoffman, B. F.
Effects of procaine amide on the canine ventricular conducting system. *Fed. Proc.* 31:524, 1972.

- Rosen, M.; Gelband, H.; Butler, V. P., Jr. and Hoffman, B. F.
Studies of cardiac pharmacology in intact animals and isolated cardiac tissues. *Am. J. Cardiol.* **29**:272, 1972.
- Rosen, M. R.; Gelband, H. and Hoffman, B. F.
Effects of blood perfusion on electrophysiological properties of isolated canine Purkinje fibers. *Circ Res.* **30**:575, 1972.
- Digitalis intoxication studied with microelectrode techniques. *Bull. N. Y. Acad. Med.* **47**:1232, 1971
- Rosen, M. and Merker, C.
Some effects of ouabain toxicity on electrophysiologic properties of the canine ventricular conducting system. *Circulation* **46** (Suppl. II):150, 1972
- Rosen, M.; Merker, C.; Gelband, H. and Hoffman, B. F.
Correlation of electrocardiographic and cellular electrophysiologic events induced by procaine amide. *Bull. N. Y. Acad. Med.* **48**:1954, 1972
- Sachs, Howard
IV Polypeptides as transmitters of interneuronal information. *Neurosciences Res. Prog. Bull.* **10**:181, 1972.
- Saroff, A. L.; Strauss, H. C.; Bigger, J. T., Jr.; Steiner, C. and Giardina, E. G. V
Evaluation of sinus node function in patients with sinus bradycardia. *Circulation* **44** Suppl II:97, 1971
- Sawyer, W. H. (Book Review)
Endocrines and Osmoregulation. A comparative account of the regulation of water and salt in the vertebrates, by P. J. Bentley. *Science* **175**:1452-1453, 1972.
- Sawyer, W. H.
Lungfishes and amphibians: Endocrine adaptation and the transition from aquatic to terrestrial life. *Fed. Proc.* **31**: 1609-1614, 1972.
- Neurohypophysial hormones and water and sodium excretion in the African lungfish. *Gen. Comp. Endocrin. Suppl.* **3**:345-349, 1972.
- Sawyer, W. H. and Pang, P. K. T.
Neurohypophysial hormones and water and sodium balances in the South American lungfish (*Lepidosiren paradoxa*). *Proc. 4th Int. Congr. Endocrin.* p 137.
- Schoener, E. P. and Frankel, H. M
Effect of hyperthermia and P_{aCO_2} on the slowly adapting pulmonary stretch receptor. *Am. J. Physiol.* **222**:68-72, 1972.
- Schoener, E. P. and Kirsten, E. B
Perphenazine action on vestibular neurons. *European J. Pharmacol.* **19**:165-170, 1972.
- Simpson, L. L.
The use of phospholipase c in the study of receptors for neuromuscular blocking agents. *J. Neurochemistry* **19**:499-506, 1972.
- Ionic requirements for the neuromuscular blocking action of botulinum toxin: Implications with regard to synaptic transmission. *Neuropharmacology* **10**:673-684, 1971.
- Sokabe, H.; Nishimura, H.; Kawabe, K.; Tenmoku, S. and Arai, T.
Plasma renin activity in varying hydrated states in the bullfrog. *Am. J. Physiol.* **222**:142-146, 1972.
- Strauss, H. C. and Bigger, J. T., Jr.
Slowed conduction, block and reentry in perinodal fibers. *Circulation* **44** Suppl. II:74, 1971.
- Sunde, D.; Osinchak, J. and Sachs, H.
Nucleic acid metabolism of the neuroglial cells of the rat neural lobe. *Brain Res.* **47**:195-216, 1972.
- Sunde, D.; McKelvy, J. and Sachs, H.
Studies on RNA methylation and dissociation between RNA and protein biosynthesis in neural lobes of dehydrated rats. *Brain Res.* **47**:237-253, 1972.
- Sunde, D. and Sachs, H.
Fractionation of RNA of the rat neural lobe labeled *in vitro*: Comparison with RNA of cerebral cortex labeled *in vivo*. *Brain Res.* **47**:217-235, 1972.
- Suzuki, J. B.; Bokkenheuser, V. and Kelly, W. G.
Metabolism of deoxycorticosterone by mixed bacterial flora of human feces. *IV International Congress of Endocrinology, Excerpta Medica Internatl Congress Series No. 246*:212, 1972
- Ten Eick, R. E.; Bassett, A. L. and Okita, G. T
Role of Na, K-activated ATPase in the transmembrane transport of K^+ and Na^+ . *Abstracts 5th Annual Meeting Int. Study Group for Cardiac Metabolism* p. 81, 1972.
- Waldo, A. L.; Mukherjee, N. D.; Butler, V. P., Jr.; Wotman, S. and Malm, J. R.
Relationship of digitalis to arrhythmias following open heart surgery. *Clin. Res.* **20**:403, 1972.
- Waldo, A. L.; Krongrad, E.; Bowman, F. O., Jr.; Kaiser, G. A.; Husson, G. S. and Malm, J. R
Electrophysiological considerations during total repair of transposition of the great vessel. *Circulation* **36** (Suppl. II):131, 1972.
- Wang, Hsueh-hwa; Huang, T. F.; Kahn, N. and Wang, S. C.
Effects of tetrodotoxin on medullary vasomotor and respiratory control mechanisms. *J. Pharmacol.* **180**: 580-590, 1972.
- Wang, H. H. and Kuo, J. S.
Responses of large and small coronary, femoral and mesenteric arteries to smooth muscle relaxants. *Fed. Proc.* **31**:597, 1972.
- Weiss, R. M. and Bassett, A. L.
Electrical and mechanical activity of ureteral muscle. *Abstracts, International Congress Physiological Sciences, XXV Int. Congress*, **9**:600, 1971.
- Mechanical properties of cat ureter. *Fed. Proc.* **30** 436, 1971.
- Weiss, R. M.; Bassett, A. L. and Hoffman, B. F.
Dynamic length-tension curves of cat ureter. *Am. J. Physiol.* **222**:388-393, 1972.
- Weiss, R. M.; Rosen, M. R.; Albert, D. M. and Hoffman, B. F.
Effects of extracellular potassium concentration and catecholamines on resting membrane potential of murine neuroblastoma cells. *The Physiologist* **15**:301, 1972.

- Weiss, R. M.; Holcomb, W. and Bassett, A. L.
Excitability of *in vitro* normal and dilated human ureteral segments. *Investigative Urology* 10:131-134, 1972.
- Weld, F. M. and Bigger, J. T., Jr
Effect of procaine amide on membrane conductance of cardiac Purkinje fibers. *Circulation* 46 (Vols. 4, suppl. II): 39 (October, 1972)
- Wit, A. L. and Bassett, A. L.
Automaticity and reentry in the mitral valve; relation to genesis of atrial arrhythmias. *Circulation* 46 (Suppl. II):11, 1972
- Possible site of origin of left atrial rhythms. *Fed. Proc.* 31:523, 1972.
- Wit, A. L.; Cranefield, P. F. and Hoffman, B. F
Slow conduction and reentry in the ventricular conducting system. II. Single and sustained circus movement, *Circ. Res.* 30:11, 1972.
- Wit, A. L.; Hoffman, B. F. and Cranefield, P. F
Slow conduction and reentry in the ventricular conducting system. I. Return extrasystoles in canine Purkinje fibers. *Circ. Res.* 30:1, 1972

Physiology

JOHN V. TAGGART

Dalton Professor and Chairman of the Department

During the past year the Department of Physiology, with the support of a grant from the Alfred P. Sloan Foundation, initiated a program for visiting scientists concerned with molecular mechanisms of nerve cell membranes. During the first year of the program, the scientists who visited the Medical Center to participate in lectures, seminars and round-table discussions were Professor Manfred Eigen and Drs. Eberhard Neumann and Ruthold Winkler of the Max Planck Institute of Goettingen and Professor F. S. Sjostrand of the University of California.

Dr. John S. Britten was promoted to Associate Professor and Dr. John P. Reuben was appointed Associate Professor of Physiology (Neurology). Dr. LeRoy Constantin resigned as Associate Professor to accept a post at Washington University in St. Louis. Dr. John V. Taggart spent a portion of a sabbatical leave in the Department of Clinical Science at the University of Cape Town and the Groote Schuur Hospital and visited at the University of Natal in Durban. Dr. William L. Nastuk was appointed chairman of a provisional committee to create an Institute of Bioengineering at Columbia University. Dr. David Schachter was re-elected to the Executive Committee of the Faculty Council and continues to serve in the University Senate and its Budget Review Committee. Dr. Shu Chien organized and chaired a symposium on red cell aggregation at Aberdeen, Scotland, and served on the scientific organization committee for the International Congress of Biorheology at Lyon, France. Dr. Paul

Witkovsy spent a sabbatical year at Kings College, London, and the Marine Laboratory in Plymouth, England.

Mr. Alan Edelson, Miss Christina Sekaer, Mrs. Kathleen Tomasulo and Mr. Joel Schiff completed the requirements for the Ph.D. degree during the past year. Eleven other students are currently candidates for the Ph.D. degree.

Research

Dr. Nastuk and his associates have continued their studies of neuro-muscular transmission, particularly on the mechanisms of action of pharmacological agents which can influence presynaptic release or the behavior of postjunctional membrane receptors. Dr. Joannes H. Karis (Anesthesiology) has developed a mammalian diaphragm preparation to study simultaneously single fiber action potentials and contractile tension output during application of synthetic curare-like agents. Dr. Fleur L. Strand of the Department of Biology at New York University is studying the action of certain ACTH fractions and adrenal cortical steroids on neuromuscular transmission. Dr. Steven Feldberg of the Brookhaven National Laboratories is studying the electrochemical bases underlying the iontophoresis of ions and drugs from micropipettes. Mr. Craig Wolfson, graduate student in Biomedical Engineering, is studying the effects of temperature on reversal of postjunctional membrane receptor desensitization produced by carbamylcholine.

The Laboratory of Hemorheology under the di-

rection of Dr. Shu Chien continued work on the mechanisms regulating blood flow in health and disease. Dr. Shunichi Usami has demonstrated that red cell deformability is a function of the intracellular hemoglobin concentration. Dr. Cyrus Bryant continued to study the deformation of red cells during passage through narrow channels with the use of a high-speed microcinematographic technique. Dr. Richard Skalak (Civil Engineering and Applied Mechanics) in analyzing the elastic modulus of red cell membrane, has described the mechanical behavior of the membrane by a strain energy function. Dr. Usami has designed a light reflectometer which can be used to quantify red cell aggregation under controlled flow conditions. Dr. Kung-ming Jan, postdoctoral fellow, has continued to study the role of surface charge on red cell aggregation as modified by treatment with neuraminidase. Comparable results have been obtained with the cells of a patient with neuraminic acid deficiency examined in a collaborative study with Drs. George Cooper (Anatomy), Calderon Howe (Microbiology), Louis H. Miller (Tropical Medicine) and Parvis Lalezari (Montefiore Hospital). Mr. Ronald Carlin, graduate student, and Dr. Peter M. Scholz, Visiting Fellow (University of Basel, Switzerland) are working on an experimental model for studying circulatory changes following coronary arterial occlusion. With Dr. J. Thomas Bigger, Jr. (Medicine) Drs. Jan, Usami and Chien studied the serial changes in blood rheology in acute myocardial infarction. With Dr. John Laragh (Medicine), studies were begun to investigate blood rheology changes in hypertensive patients. Changes in blood viscosity, red cell deformability, organic phosphate concentration and oxygen dissociation curve in septic patients are being studied in collaboration with Drs. Scholz, John Kinney and Frank Gump (Surgery). Drs. Keith Reemstma and David Bregman (Surgery) and Drs. Skalak and Chien have begun an analysis of rheological factors in regulating coronary circulation, especially in relation to surgery of the coronary vessels. Dr. John F. Bertles (St. Luke's Hospital), and Drs. Chien and Usami have studied the influence of oxygen saturation in the viscosity of sickle cell hemoglobin solution. The Laboratory of Hemorheology is participating in the Harlem Hospital-Columbia Comprehensive Sickle Cell Center to study blood viscosity changes in sickle cell crisis.

Dr. David Schachter and Szloma Kowarski continuing studies on the biochemical basis of the intestinal absorption of calcium and the mechanism of action of vitamin D, have found a new vitamin

D-dependent cellular transport mechanism for zinc in the small intestine. Dr. Matthew Guy, postdoctoral fellow, is continuing studies on the cation-dependent ATPases of intestinal brush borders and their relationship to cation transport dependent on vitamin D. Dr. Carolyn Stanek, postdoctoral fellow, is studying intestinal cation-binding proteins and their role in absorption. Dr. Ellen Batt has characterized glucose transport across human erythrocyte membranes as an asymmetric transfer and is developing procedures for the biochemical isolation of the transport apparatus. Laura Schlessinger, graduate student, is studying the mechanism of action of insulin on hexose transfer across isolated rat adipocytes. Dr. Richard Abbott, organic chemist, is synthesizing a group of new impermeant reagents which will permit a functional dissection of cell surfaces and plasma membrane structure. Donald Mattison, medical student, is developing preparations of placental tissue for the study of transplacental transport.

Dr. Raimond Emmers and his associates completed an analysis of the neural mechanisms which govern water intake and its retention, showing that signals for water consumption arise from taste receptors and peripheral osmoreceptors located in the portal vein-hepatic area, whereas water retention is governed mainly by hypothalamic neurons which are activated directly by changes in the osmotic pressure of the body fluids. Dr. Valentin Corpus studied a negative feedback circuit which connects the water retention and the water intake control neurons. Marvin I. Ruderman, medical student, has begun studies on the neurophysiological basis of analgesia observed with acupuncture. Christina Sekaer, graduate student, completed her studies on the anatomical relationships and the functional characteristics of neurons for the central relay of several sensory modalities from the tongue. Mark H. Jaffe, dental student, continued a study on the topographical organization of the trigeminal nuclei in the rat.

Drs. Martin Blank and John S. Britten have begun work on the membranes of mammalian spermatozoa, studying the factors affecting contact with electrode surfaces. With Mrs. Beatrice Lee, they have continued their collaborative efforts on problems related to membrane properties, such as the mechanical strength of protein films.

Drs. Louis J. Cizek and Mero R. Nocenti, continuing studies on the polyuric-polydipsic syndrome of food-deprived male rabbits, have found that although the enhanced fluid exchange is accompanied by increased renal salt loss, salt deficiency *per se*

does not induce the syndrome. Vasopressin does not appear to be involved in the syndrome; amelioration of the syndrome by estrogen occurs without alterations in the renal handling of salt and water, but through an effect upon the thirst mechanism. Irene Hikawyj, graduate student, has demonstrated the inhibitory effects of adrenal steroids on protein metabolism in connective tissue in an *in vitro* system.

Dr. Paul Witkovsky, on sabbatical leave in England, worked with Professor B. B. Boycott on the synaptic connections of roof nucleus in the selachian brain.

Dr. Arthur Karlin has now tagged the receptor for acetylcholine in intact cells, membrane fragments, and detergent extracts, and has achieved considerable purification of the labeled receptor by

affinity chromatography; the close relationship between the affinity-labeled site and the cobra toxin binding site has been demonstrated.

Donors

The department acknowledges with gratitude the support received from the following sources: American Heart Association, Coffey Research Gift, Department of Defense, Magnus and Georgianne Gregersen Fund, Health Research Council of New York City, Heart and Lung Foundation, Maxwell Upson Foundation, Merck Sharp and Dohme, National Science Foundation, National Institutes of Health, New York Heart Association, Mrs. George W. Perkins, Scaife Family Charitable Trust, Smith Kline and French Foundation, Alfred P. Sloan Foundation, and anonymous donors.

1972 Publications

Physiology

Benis, A. M.; Usami, S. and Chien, S.

Determination of the shear stress-shear rate relation for blood by Couette viscometry. *Biorheology* 8:65-69, 1971.

Evaluation of viscous and inertial pressure losses in isolated tissue with a simple mathematical model. *Microvascular Research* 4:81-93, 1972.

Benis, A. M.; Chien, S.; Usami, S. and Jan, K.-M.

Inertial pressure losses in perfused hindlimb: A reinterpretation of the results of Whittaker and Winon. *Proc. I. Internat. Congr. Biorheol.*, Lyon, France. Pergamon Press, p. 13, 1972.

Blank, M.

The measurement of monolayer permeability. In: *Techniques of Surface Chemistry and Physics. Vol. I.* Good, Stromberg and Patrick, eds., Marcel Dekker Inc., New York, p. 41, 1972.

The role of surface forces in drug-receptor interactions. *J. of Colloid and Interface Science* 38:470, 1972.

Cooperative effects in membrane reactions. *J. of Colloid and Interface Science* 41:97, 1972.

Chien, S.

Present state of blood rheology. In: *Hemodilution, Theoretical Basis and Clinical Application*, edited by K. Messmer and H. Schmid-Schönbein, Karger, Basel, pp. 1-40, 1972.

Chien, S.; Jan, K.-M. and Usami, S.

Rheological considerations of colloid replacement. *les solutés de substitution rééquilibration métabolique en anesthésiologie et en réanimation.* Societe Française D'Anesthésie, D'Analgesie et de Réanimation. Librairie Arnette, Paris, pp. 153-166, 1971.

Costantin, L. L.

Intracellular process associated with the activity cycles. Introductory remarks in *Contractility of Muscle Cells and Related Processes*, R. J. Podolsky, ed., Prentiss Hall Inc. pp. 69-72, 1971.

Inward spread of activation in frog skeletal muscle. *Ibid.* pp. 89-98, 1971.

Eisenberg, R. S. and Costantin, L. L.

The radio variation of potential in the transverse tubular system of skeletal muscle. *J. of Gen. Physiol.* 58:700-701, 1971.

Emmers, R. and Jaffe, M. H.

A double somatotopic representation of afferent projection in the rat trigeminal nuclei. *Anat. Rec.* 172: 450, 1972.

Emmers, R.

Decoding of sensory messages emitted by single neurons of the cat thalamus during stimulation of the tongue. *Fed. Proc.* 31:369, 1972.

Emmers, R. and Passamonte, P.

Ineffectiveness of osmotic stimuli to induce water intake in rats with lesioned thalamic taste nucleus. *The Physiologist* 15:126, 1972.

Hu, Jane H.

Nature of postjunctional receptors. *Am. J. Physiol.* 223:882, 1972.

Jan, K.-M. and Chien, S.

Role of the surface charge in RBC aggregation. *Fed. Proc.* 31:341, 1972.

Role of the surface charge in red cell interactions. *Abst. VI. European Conf. Microcirc., Aberdeen, Scotland*, p. 54, 1972.

Miller, I. R.; Britten, J. S. and Blank, M.

Polarographic assay of p-Nitrophenyl phosphatase activity. *Analytical Biochemistry* 50:84, 1972.

Miller, L.; Chien, S. and Usami, S.

Decreased deformability of Plasmodium Coatneye-infected red cells and its possible relation to cerebral malaria. *Am. J. Trop. Med. and Hygiene* **21**:133-137, 1972

Naka, K. I. and Witkovsky, P.

Dogfish ganglion cell discharge resulting from extrinsic polarization of the horizontal cells. *J. Physiol. (Lond.)* **223**:449-460, 1972.

Nastuk, W. L.; Koester, J. D. and Gissen, A. J.

The role of divalent cations and certain drugs in the activation and inactivation of muscle postjunctional receptors. In: *Cellular Biology and Toxicity of Anesthetics*. B. Raymond Fink, ed., Williams and Wilkins, Baltimore, 1972.

Oronsky, A. L. and Nocenti, M. R.

Influence of glucocortical hormone and actinomycin D in the uptake of labeled amino acids in granulomas. *Arch Internat. de Pharmacodynamie et de Therapie* **195**:16-23, 1972.

Reiter, M. J.; Cowburn, D. A.; Prives, J. M. and Karlin, A.

Affinity labeling of the acetylcholine receptor in the electroplax: electrophoretic separation in sodium dodecyl sulfate. *Proc. Nat. Acad. Sci.* **69**:1168-1172, 1972.

Schachter, D. and Kowarski, S.

Vitamin D and the intestinal transport of zinc. *Am. Soc. Clin. Invest.* **283**:86a, 1972.

Skalak, R.; Chen, P. H. and Chien, S.

Effect of hematocrit and rouleaux on apparent viscosity in capillaries. *Biorheology* **9**:67-82, 1972.

Tomasulo, K. and Emmers, R.

Activation of neurons in the gracile nucleus by two afferent pathways in the rat. *Exper. Neurol.* **36**:197-206, 1972.

Usami, S. and Chien, S.

Shear deformation of red cell ghosts. *Proc. I. Internat Congr. Biorheol.* Lyon, France. Pergamon Press, p 34, 1972.

Light reflectometry of red cell aggregation in shear flow. *Abst. VI. European Conf. Microcirc., Aberdeen, Scotland*, p. 20, 1972.

Werman, R.; Brookes, N. and Blank, M.

The stoichiometry of transmitter-receptor interactions. *Experientia* **27**:1120, 1971.

Witkovsky, P.

Eye: The structure of the human eye. *Encyclopedia Americana* **10**:809-814, 1972.

Psychiatry

LAWRENCE C. KOLB

Professor and Chairman of the Department • Director of Service

Teaching

Two of the department's most distinguished members of the faculty retired at the close of this academic year. They were Drs. Viola W. Bernard and William S. Langford. Dr. Langford joined the faculty in 1935. His leadership over the years has led to the outstanding development of the Division of Child Psychiatry, and, on the national scene, of the American Board of Child Psychiatry. Dr. Bernard, too, who joined the faculty in 1942, will be remembered for her imaginative development of the Division of Community and Social Psychiatry and her active participation in the evolution of the Columbia Washington Heights Community Mental Health Project. Both will continue to teach. Dr. Langford was appointed Professor Emeritus and Dr. Bernard, Special Lecturer; and both as Consultants in the Presbyterian Hospital.

The department accepted with deep regret the resignation of Dr. Shervert S. Frazier, Vice Chairman, who accepted a position as Professor of Psychiatry in the Harvard University School of Medicine and Physician-in-Chief of the McLean Hospital, Boston, Mass. Dr. Frazier's outstanding accomplishments as an educator and clinician have been widely recognized. It may be noted that he was elected President of the American Board of Psychiatry and Neurology at the commencement of this year, and also President of the Association for Research in Nervous and Mental Disease for the year 1973.

Dr. Donald H. Dunton was appointed Chief of the Division of Child Psychiatry commencing July 1, 1972. Dr. Dunton has been honored nationally by his election to the Presidency of the American Board of Child Psychiatry.

Dr. Lissy Jarvik resigned to become Professor in the Department of Psychiatry UCLA, and Director of Psychogenetics Unit, Center for Psychosocial Medicine, Veterans Administration, Los Angeles. Dr. Lawrence C. Kolb was elected to the Society of Scholars of the Johns Hopkins University, and received the Joan Plehn Award for Human Service of the Mental Health Association of New York and Bronx Counties. Dr. Murray Glusman was appointed Vice President of the Association for Research in Nervous and Mental Disease. He was appointed a member of the Research Advisory Committee to the Department of Mental Hygiene by Commissioner Alan D. Miller of the New York State Department of Mental Hygiene. Dr. Leo Srole was elected Honorary Fellow in the American Psychiatric Association. Dr. Ronald R. Fieve was awarded the New York State Department of Mental Hygiene's Distinguished Service Citation for 1972. Dr. Donald S. Kornfeld received a citation for distinguished service to the Inter-Society Commission for Heart Disease Resources 1968-1971. Dr. Jules R. Bemporad joined the staff of the Division of Child Psychiatry on a half-time basis as Director of Pediatric Psychiatry, Babies Hospital. Dr. Florence Liben is devoting more time to writing and

other projects but continues participation in the doctoral program of the Division of Community Psychiatry and serves as chairman of doctoral committees for two of the Division's candidates. Joan Shapiro resigned to accept appointment as Associate Professor of Sociology and Social Work at Smith College.

The Department of Psychiatry has reviewed its entire undergraduate and residency curriculum, with particular attention to the changing role of the internship in graduate medical education and the widespread interest in shortening the overall training period for physicians. Expanded elective opportunities in the final stages of undergraduate medical education allow more highly individualized programs designed for the needs of specific trainees, and have led to the acceptance of selected applicants who begin their residency training immediately upon graduating medical school. Their entire professional education can now be integrated from the beginning of medical school to the completion of residency training, avoiding unnecessary redundancy.

Since 1963 the Division of Educational Research has explored the potentialities of videotape for use in psychiatric education. A project entitled "The Electronic Textbook of Psychiatry" was evolved with the aim of a comprehensive goal of teaching psychopathology and treatment. It has been possible within the year to permit videotape production of professional quality employing the new technology for conversion-replication of videotape to video cassettes for distribution throughout a network of medical schools. Four chapters of The Electronic Textbook are now being used at the University of California in Los Angeles Medical School, The Washington University Medical School in St. Louis, the Western Reserve University Medical School in Cleveland, and the University of Vermont Medical School in Burlington. The network will be extended to another fifteen medical centers in 1972. Ten more chapters, already in production, will be added.

As Director of the Interdisciplinary Research Program in the Biological Sciences in Relation to Mental Health, Dr. Murray Glusman has worked closely with Dr. Melvin B. Yahr, Director of the Clinical Research Center in Parkinsonism and Allied Diseases to develop a highly successful seminar series in neurobiology jointly sponsored by both groups. The neurobiology seminars have brought to the medical center leading investigators in the neurosciences from research centers throughout the world. The seminars have been important in stimulating interest in the neurosciences throughout the

units of the Columbia-Presbyterian Medical Center and throughout the University as a whole.

In the Division of Community and Social Psychiatry several new courses have been introduced into the division's curriculum while others have been changed or modified in keeping with new emphases in the field and trainee needs and career goals. Greater stress is being placed on developing skills in mental health administration by the introduction of such a sequence to be offered by Dr. Marvin E. Perkins. Dr. Stuart Keill will teach the second quarter on "principles and practice of community psychiatry with an emphasis on organization and administration. A new elective on the psychological aspects of early family formation was prepared and conducted by Dr. Bernard and Mrs. Helene Schoenfeld. It consists of a continuous case discussion of an ongoing longitudinal study, augmented by audio and video tape recordings, of a young couple's family formation from the period prior to conception of their first child until after birth of the second baby.

The public health-mental health curriculum for general students in the School of Public Health for which the Division of Community Psychiatry carries responsibility has been completely revised. A full first semester course on emotions and the life cycle was conducted jointly by Drs. Alan Tuckman and Victor Goldin. This course or its equivalent was deemed a prerequisite for the three one quarter courses to be offered in the second semester. These are, concepts of community mental health: theory and practice to be taught by Dr. A. R. Foley, organization and delivery of community mental health services to be offered by Dr. John Talbott, and the third, special problems which will deal with drug abuse, alcoholism, poverty and minority groups, to be taught by Dr. John Rosenberger.

Research

In the clinical sciences Dr. Ronald Fieve and his colleagues have continued to study the manic depressive state. Of particular importance this past year has been research done in a population of 250 manic depressive and depressive patients which has concentrated on the genetic characterization of the sample in preparation for biochemical testing and enzyme surveys. This is a necessary step in the reclassification of the affective disorders, which may lead to the mapping out of certain modes of transmission of these illnesses.

Drs. Julien Mendlewicz, Joseph Fleiss and Ronald Fieve have reported on a linkage study of seven informative families, assorting for protan and deu-

tan color blindness (recessive x-linked markers), using the family history study method to evaluate the distribution of psychopathology in these families. Linkage between the locus for manic-depressive illness and the loci for the two genetic markers were studied. Close linkage was found between the loci for manic-depressive illness and protan color blindness. Linkage between the locus for manic-depressive illness and the locus for deutan color blindness was slightly less close, but statistically significant.

In related work, Drs. Fieve, Mendlewicz and Fleiss studied the Xga blood group, a dominant x-linked marker, in six informative families, assorting for this genetic marker and manic-depressive illness. The results of the linkage analysis in these pedigrees likewise supports a dominant x-linked transmission of manic-depressive illness within the families studied. These families were all taken from a sample of over 80 carefully diagnosed bipolar manic-depressive patients consecutively admitted to the Lithium Treatment and Research Clinic at the Psychiatric Institute.

Drs. Frank Stallone, Julien Mendlewicz, David Dunner and Ronald Fieve have completed the first American double-blind prophylactic study of lithium in bipolar illness. Results show that lithium prophylaxis for bipolar mania is both dramatic and unequivocal. The findings also provide clear support for lithium prophylaxis of bipolar depression, although the finding is less outstanding for depression than with mania.

In investigating the metabolism of the rubidium ion in the cerebrospinal fluid of depressed patients, Drs. Dunner, H. Meltzer and Fieve have found that there is a plasma cerebrospinal fluid gradient to rubidium, and that following rubidium loading, the half-life of rubidium in spinal fluid, and presumably in brain as well, parallels that in blood.

Dr. Leslie Baer has continued clinical and experimental studies of renal lithium handling and lithium toxicity. Together with Drs. Fieve and Glassman, and Mrs. S. Kassir, he has described negative sodium balance appearing during lithium toxicity in both animals and man. These observations suggested a pathogenic mechanism in lithium toxicity. In animal studies they found a blunted response to the sodium retaining properties of mineralocorticoid hormones during toxicity.

Dr. Baer, in collaboration with Drs. John Laragh, Fritz Buhler, Hans Brunner and Daricott Vaughan (Medicine) also is pursuing studies of the mechanisms of renin release, their relationship to the autonomic nervous system and to experimental

and clinical forms of hypertension. The mechanisms of hypertension have also been examined in a strain of genetically hypertensive rats in collaboration with Dr. Abbie Knowlton (Medicine).

Together with Mr. John Allyn, a third year medical student, Dr. Baer has studied the effects of a monoamine oxidase inhibitor on the blood pressure and plasma renin concentration of experimentally hypertensive animals. This work won for Mr. Allyn the student research award of the Psychiatric Institute.

Dr. Sidney Malitz and his colleagues, Drs. Alexander Glassman, Maureen Kanzler and James Perel, have been using phenylbutazone to predict individual response to the most widely used anti-depressant, imipramine. Preliminary data show that the absorption and metabolism values from a single dose of imipramine predict the chronic plasma concentration of imipramine. Dr. Malitz and his co-workers have previously shown a relationship between plasma concentration of anti-depressant and clinical response. Through improving prediction and determining more effective dosage levels using plasma concentrations the likelihood of more effective outpatient treatment and reduction of costly hospital stays is greatly enhanced.

Dr. Perel and Dr. Maria Hurwic have been collaborating with Dr. Bertram Winsberg of the Child Psychiatry Unit, New York State Department of Mental Hygiene, in studying the disposition of imipramine in hyperactive children. This drug is highly effective in this condition. Their findings show that the metabolism and plasma protein binding in children is very different from what we observed with adult depressed patients. Since the plasma concentrations of free imipramine are much higher in children the onset of action should be much faster than in adults.

T_3 (sodium L-tri-iodothyronine) usually given for thyroid replacement therapy has also been reported to potentiate the effect of imipramine in depressed female patients. Drs. Perel, Hurwic, Glassman and Malitz have been investigating this phenomenon. Their preliminary findings appear to bear out this clinical observation. It appears that T_3 works by freeing more imipramine from protein binding. It is believed that this free form becomes more available to the target tissues and brings about clinical improvement.

Drs. Zeidenberg and Malitz have been employing the technique of multiple monitored electroshock therapy for the treatment of depression. This is a technique in which a number of treatments are given over a period of several hours. The results

appear to be as effective as those obtained with the more conventional technique in which the treatments are administered 3 times a week for 2 to 3 weeks. The savings, both in time and money, with this new technique may be considerable.

Dr. Zeidenberg and Malitz in collaboration with Dr. Gabriel Nahas (Anesthesiology) have embarked on an investigation of the physical and psychological aspects of chronic marihuana intoxication in Morocco. It is planned to compare these results ultimately with those attained from American marihuana users.

Drs. Donald S. Kornfeld, Stanley S. Heller and Kenneth G. Frank received a grant to initiate a study of the psychiatric aspects of coronary artery revascularization. Their previous study on post-cardiotomy delirium revealed that patients with personalities characterized by a high degree of activity and dominance may be pre-disposed to delirium.

Drs. Harry Albert and Donald S. Kornfeld studied the experience of 28 patients who threatened to sign out of the Presbyterian Hospital against medical advice and who were then seen by a psychiatric consultant. Following consultation, 22 remained in the hospital, 4 returned in 72 hours and 2 returned for out-patient appointments. The underlying reasons for this behavior were described and suggestions for more effective management were derived therefrom.

Drs. Athanasia Balkoura, Rodman Gilder, Jr., and Miss Penelope Buschman, Clinical Specialist in Nursing in Child Psychiatry, are studying a group of children, 0-15 years old with leukemia in the hopes of elucidating the child's specific concepts, attitudes and emotional reactions, the emotional reactions of the family, and the role of the hospital staff toward the suffering of this illness.

Drs. Leah Beck, Mary MacKay, William S. Langford and Miss Grace Sum, psychiatric social worker, are involved in retrospective studies of children who have been on stimulant medication for minimal brain dysfunction.

In recent years it has been demonstrated that brief, rather than long term, in-patient psychiatric hospitalization is not only feasible but may be advantageous for the patient. However, the effects on the family have not been adequately studied. In addition, there have been no studies comparing brief hospitalization followed by a period of transitional day care with brief hospitalization followed by discharge directly into the community. Drs. Marvin I. Herz and Robert L. Spitzer are now engaged in investigating these problems. The differ-

ential effects of a variety of treatment programs on patients and their families are being investigated by cross-sectional evaluations on admission and at various intervals after admission.

In the Psychosocial Sciences, Professor E. Gruenberg with Drs. Roger Christenfeld, Ahmed Hakki and Julien Mendlewicz are attempting a study of depressed mood locating methods. It is an attempt to (a) determine the set of structured questionnaire items which best predict to psychiatric assessment of depressed mood level in a non-patient population, and (b) study the distribution of depressed mood prevalence in a population while at work. Preliminary analyses of the collected data showed that the depressed mood prevalence rate, as ascertained by psychiatric interviews, among women was highest in the 40's while among men the prevalence rate was lowest in their age group.

Dr. E. M. Gruenberg and Miss Dorothy Wiehl are examining duration of hospitalization, previous psychiatric treatment, age, sex, marital status and home conditions. In the study of the functioning of schizophrenic patients two years after admission to a mental hospital, case histories were reviewed to look for personal characteristics associated with higher and lower levels of psychosocial functioning.

Analysis of the data showed that long lasting SBS associated with hospital admission were extremely rare: 90 percent of all episodes terminated within two weeks. There was, however, a great variance in the length of stay in the hospital after termination of social disability: the different organization of psychiatric services in the three counties (Dutchess, Albany, Westchester) of origin of the patients involved in this study may be responsible for the variation for there was no significant relationship between length of stay and personal characteristics, psychiatric history or socioeconomic factors.

A pilot study of the effects of marihuana (THC) on language processes was undertaken by Dr. Joseph Jaffe in collaboration with Drs. Malitz, Zeidenberg, and Clark. The findings suggest that an effect of the drug on short-term memory is responsible for characteristic alterations of coherence of speech.

Work has continued in the study of behavioral and environmental analysis of children with a high risk for schizophrenia (Drs. Erlenmeyer-Kimling and Rainer). Over 20 subjects with two schizophrenic parents have been tested and evaluated. These subjects are part of a larger group of offspring of two schizophrenic parents located through their parents' hospitalizations several years ago. They are being examined now for indications of

vert or incipient behavioral pathology, as well as or the purpose of collecting detailed environmental histories.

As part of their family studies of deafness, Mrs. Ruth Tendler with Drs. Kenneth Altshuler and John Rainer have investigated psychological characteristics of hearing children of deaf parents. These children appear to be midway between hearing and deaf subjects in abstract behavior, and cognitive functioning, with greater anxiety and greater impulse control than either group. Such findings can be of great help in counseling, as well as in the theoretical investigation of communication anomalies in the family setting.

Dr. M. M. Rapport and his associates, Drs. L. Graf, A. Kisic, and A. Bathija extended their studies of the chemistry of membrane antigens of defined structure with new findings concerning the chemical nature, immunogenicity, and specificity of glycolipids of nerve cell membranes, erythrocytes, and cells of the gastrointestinal tract. The chemical structure of cytolipin R was definitively established.

Drs. G. Alexander and L. Kopeloff showed that the decrease in convulsive threshold produced by chlorophenylalanine was abolished in cerebellectomized animals. Dr. Alexander found that phenothiazines decreased the rate of conception in rats, and that certain hallucinogens increased the incidence of seizures in a strain of mice susceptible to audiogenic seizures.

Dr. H. Tamir and Mr. Y. L. Huang have detected a soluble protein in brain that has a high binding affinity for serotonin. They are also studying new methods of preparing synaptosomes and synaptic vesicles using sodium diatrizoate instead of sucrose.

Dr. Leon Roizin in cooperation with Drs. Shigeo Hashimoto and Kuo-Jung Tom, Mr. Jevons C. Liu and Mrs. Barbra Eisenberg-Gelber have demonstrated fine structural alterations of the Golgi complex and irregular distribution of thiamine pyrophosphatase reaction products in the neurons of the CNS in rats during acute and chronic phases of methadone administration. Dr. Roizin, M. Kaufman and George Jervis, with Drs. Eirene Popovitch and S. Hashimoto, using the histochemical techniques for thiamine pyrophosphatase (TPP), glucose-6-phosphatase (G-6-P) and acid phosphatase (AcP) demonstrated various stages of senile plaque development and evolution in the cerebral cortex, basal ganglia, mesencephalon and cerebellum of patients affected by senile psychosis, Alzheimer's and Down's disease. Of particular interest was the presence of senile plaques also in some heroin addicts who died of overdoses of methadone.

Patient Care

Within the Medical Center complex there have been several important changes in psychiatric services. An expanding program of genetic counseling is presently conducted at the New York State Psychiatric Institute by Drs. Mihaly Bartalos and John Rainer. On the average, two families a week are referred for help in deciding questions of marriage and parenthood in the presence of familial disease. While mainly psychiatric and neurologic conditions are referred, a wide range of other metabolic, sensory, skeletal and hematologic diseases are seen. All of these require careful diagnosis and genetic investigation, as well as skilled counseling so that feelings and attitudes of the families are understood and respected.

A new comprehensive community mental health service has been initiated in the Washington Heights area of upper Manhattan through the joint collaboration of the New York State Psychiatric Institute, Meyer-Manhattan Hospital, and the Washington Heights-West Harlem-Inwood Mental Health Council, Inc. The New York State Department of Mental Hygiene is contributing increased staffing for the project.

Under the new plan the Washington Heights Community Service, New York State Psychiatric Institute, directed by Dr. Marvin I. Herz, will expand outpatient and community services and in addition supervise clinical care on the ward at Meyer-Manhattan State Hospital serving patients from Washington Heights. Comprehensive psychiatric care will be available to patients above the age of 13 years who live in the designated catchment area, which has a population of 90,000.

Acknowledgments

The members of the department are deeply grateful for the support of their research endeavors during the past year to the United States Department of Health, Education, and Welfare, National Institute of Mental Health, the New York State Department of Mental Hygiene, Foundations' Fund for Research in Psychiatry, Andrew Mellon Foundation, Charles E. Merrill Trust, The Ethel B. and John L. Johnson Memorial Gift, Association for the Aid of Crippled Children, Milbank Memorial Fund, Ciba-Geigy Corporation, The Faigel Leah Foundation Inc., Grant Foundation Inc., The van Ameringen Foundation Inc., Mrs. Elizabeth Dollard, Mrs. Elizabeth Harris, Mrs. Jean A. Twitchell, Dr. Neil MacLean.

1972 Publications

Psychiatry

Alexander, G. J. and Gray, R.

Induction of convulsive seizures in sound sensitive albino mice: Response to various signal frequencies, *Proc. Soc. Exper. Biol. Med.* **140**:1284-1288, 1972.

Alexander, G. J.; Gray, R. and Machiz, S.

Increase in reflex epileptiform activity in audiosensitive mice following treatment with lysergic acid diethylamide and mescaline. *Federation Proc.* **31**:249 Abs. 1972.

Alexander, G. J.; Machiz, S. and Alexander, R. B.

Phenothiazine tranquilizers: Effect of prolonged intake. In: *Drugs and Fetal Metabolism*. M. H. Klingberg, J. Chemke and A. Abramovici, eds. Plenum Press, New York, 1972.

Altshuler, K. Z.

Breaking the sound barrier: A treatment program for the deaf. *Medical Insight* **42**:43-53, 1972.

Altshuler, K. Z. and Rainer, J. D.

Deafness unit at Rockland State Hospital. *Bull. Rockland City. Med. Soc.*, 1972.

Anderson, S. W. and Jaffe, J.

Projections between memory codes and some speech events not derivable from stimulus-response theory. *Math. Biosci.* **12**:303-320, 1971.

Baer, L.; Brunner, H. R.; Buhler, F. R. and Laragh, J. H.

Pseudo-primary aldosteronism: A variant of low renin essential hypertension? In: *Hypertension* 1972. Genest, J. and Koiw, E., eds. Springer Verlag, Berlin, 1972.

Baer, L.; Knowlton, A. and Laragh, J. H.

The role of sodium balance and the pituitary-adrenal axis in the hypertension of spontaneously hypertensive rats. In: *Spontaneous Hypertension—Its Pathogenesis and Complications*. Okamoto, K. ed. Igaku Shoin Ltd., Tokyo, 1972.

Baer, L.; Platman, S. R.; Kassir, S. and Fieve, R. R.

Mechanisms of renal lithium handling and their relationship to mineralocorticoids: A dissociation between sodium and lithium ions. *J. Psychiat. Res.* **8**:91-105, 1971.

Baer, L.; Platman, S. R. and Fieve, R. R.

Lithium metabolism: Its electrolyte actions and relationship to aldosterone. In: *Recent Advances in the Psychobiology of the Depressive Illnesses*. Williams, T. A., Katz, M. M. and Shield, J. A. Jr. U. S. Govt. Prtg. Office, Washington, D. C. 1972.

Barkai, A.; Glusman, M. and Rapport, M. M.

Serotonin turnover in the intact cat brain. *J. Pharm. Exper. Ther.* **181**:28-35, 1972.

Bartolos, M.

Time factor in cytogenetics and neoplasia. *Acta Genet. Med. Gemellol.* **20**:350-358, 1971.

Bartolos, M. and Rainer, J. D.

Ammoniacal silver as a differential stain for human metaphase chromosomes. Abs. In: *Tenth Annual Somatic Cell Genetics Conf.*, Aspen, Colorado, 1971.

Bemporad, J. and Dunton, H. D.

Catatonic episodes in childhood. *Int. J. Child Psychother.* **1**:1972.

Bernard, V. W.

Interracial practice in the midst of change. *Am. J. Psychiat.* **128**:8, 1972.

Blum, J. E.; Fosshage, J. L. and Jarvik, L. F.

Intellectual changes and sex differences in octogenarians: A twenty year longitudinal study of aging. *Develop. Psychol.* **7**:178-187, 1972.

Brunner, H. R.; Laragh, J. H.; Baer, L.; Newton, M. A.; Goodwin, F. T.; Krakoff, L. R.; Bard, R. H. and Buhler, F. R.

Essential hypertension: Renin and aldosterone, heart attack and stroke. *New Eng. J. Med.* **286**:441-449, 1972.

Brunner, H. R.; Sealey, J. E.; Laragh, J. H.; Baer, L. and Buhler, F. R.

Renin and aldosterone in the etiology and prognosis of essential hypertension: Their relation to vascular complications. In: *Hypertension* 1972. Genest, J. and Koiw, E., eds. Springer Verlag, Berlin, 1972.

Buhler, F. R.; Baer, L.; Vaughan, E. D.; Brunner, H. R. and Laragh, J. H.

Inhibition of renin secretion by propranolol: A specific treatment of renal hypertension. *J. Clin. Invest.* **51**:17a Abs., 1972.

Chusid, J. G. and Kopeloff, L. W.:

Chronic epilepsy in monkeys after cerebral implants of metal oxide powders. *Federation Proc.* **31**:820 Abs., 1972.

Clark, W. C. and Mehl, L.

Thermal pain: A sensory decision theory analysis of the effect of age and sex on d', various response criteria, and 50% pain threshold. *J. Abnorm. Psychol.* **78**:202-212, 1972.

Clark, W. C.; Goodman, J. and Mehl, L.

Effect of suggestion on the criterion for pain (Lx) and sensitivity (d'). *Proc. Am. Psychol. Assn.* **7**:871, 1972.

Clark, W. C.

Statistical decision theory: A new approach to problems in personality, social, and clinical psychology (Symposium). *Proc. Am. Psychol. Assn.* **7**:904-905, 1972.

Dohrenwend, B. S. and Dohrenwend, B. P.

Social class and the relation of remote to recent stressors. In: *Life History Research in Psychopathology, Vol. II*. Pollak, M., Robins, L. and Roff, M., eds. Univ. Minn. Press, Minneapolis, 1972.

Dohrenwend, B. P. and Dohrenwend, B. S.

Psychiatric epidemiology: An analysis of 'true prevalence' studies. In: *Handbook of Community Psychology and Mental Health*. Golann, S. E. and Eisendorfer, C., eds. Appleton-Century-Crofts, New York, 1972.

- Druss, R. G.; O'Connor, J. F. and Stern, L. G.
Changes in body image following ileostomy. *Psychoan. Quart.* **41**:195-206, 1972.
41:195-206, 1972.
- Dunner, D. L.; Gershon, E. S.; Goodwin, F. K.;
Murphy, D. L. and Bunney, W. E., Jr.
Excretion of 17-hydroxycorticosteroids in unipolar and bipolar depressed patients. *Arch. Gen. Psychiat.* **26**:360-363, 1972.
- Dunner, D. L. and Goodwin, F. K.
The effect of L-tryptophan on brain serotonin metabolism in depressed patients. *Arch. Gen. Psychiat.* **26**:364-366, 1972.
- Esser, A. H.
Environmental design needs empathy to combat social pollution. In: *Environmental Design Perspectives*. Preiser, W. F. E. and Regan, T. L., eds. ASMER, Orangeburg, N. Y., 1972.
A biosocial perspective on crowding. In: *Environment and the Social Sciences: Perspectives and Applications*. Wohlwill, J. F. and Carson, D. H., eds. American Psychological Association, Washington, D.C., 1972.
A contribution toward the definition of aggression, review of K. E. Moyer, *The Physiology of Hostility*. Man-Environment Systems, R-14, September 1971.
Research in man-environment relations. *Man-Environment Systems*. C-3, March 1972.
Ethological contributions to understanding the human use of space. *Man-Environment Systems*. S-9, March 1972.
et al: Comments by APA Task Force on Environment and Mental Health. In: *Pollution: Its Impact on Mental Health*. National Clearinghouse for Mental Health Information, Rockville, Md., 1972.
- Fieve, R. R. and Meltzer, H. L.
Rubidium: Biochemical, behavioral clinical studies. *Psychopharmacol. Bull.* **8**:14-15, 1972.
- Fieve, R. R.; Platman, S. R. and Baer, L.
Goiter detection and changing thyroid indices during lithium treatment of manic-depressive illness. *Recent Advances in the Psychobiology of the Depressive Illness*. NIMH, 257-262, 1972.
- Fieve, R. R.
Lithium studies and manic-depressive illnesses. In: *Disorders in Mood*. Zubin, J. and Freyhan, J., eds. The John Hopkins Press, Baltimore, 1972.
- Flapan, M. and Schoenfeld, H.
Procedures for exploring women's child bearing motivations, alleviating childbearing conflicts and enhancing maternal role development. *Am. J. Orthopsychiat.* **42**:389-397, 1972.
- Foley, A. R.
Pre-retirement planning in a changing society. *Am. J. Psychiat.* **128**:7, 1972.
Some critical issues in health care. *Psychiatry Digest* **33**:1, 1972.
- Forrest, David V.
Vietnamese maturation: The lost Land of Bliss. *Psychiatry* **34**:111-139, 1971.
- The American soldier and Vietnamese women. *Sexual Behavior* **2**:5, 8-15, 1972.
- Frank, K. A.; Heller, S.; Kornfeld, D. S. and Malm, J.
A survey of adjustment to cardiac surgery. *Arch. Int. Med.* **130**:735-738, 1972.
- Friedman, R. C.
The doctor who doesn't sleep. *Medical Insight*, 54-57, February 1972.
- Gardner, R. A.
The mutual storytelling technique in the treatment of anger inhibition problems. *Int. J. Child Psychother.* **1**:34-64, 1972.
"once upon a time there was a doorknob and everybody used to make him all dirty with their fingerprints . . ." *Psychology Today*. **5**:67-92, 1972.
On D. W. Winicott and some as yet undefined qualities of the child therapist. *Int. J. Child Psychother.* **1**:7-12, 1972.
On the most forbidden subject in psychotherapy. *Int. J. Child Psychother.* **1**:7-13, 1972.
Dr. Gardner's stories about the real world. Prentice-Hall Inc., Englewood Cliffs, N. J., 1972.
- Goodman, J.
Psychiatric Interview. In: *Manual of Child Psychopathology*. Wolman, B., ed. McGraw Hill, New York, 1972.
- Goodman, J. and Simmerok, B.
Behavior therapies for a children's psychiatric hospital. *Int. J. Child Psychother.* **1**:111-128, 1972.
- Gibbon, J.
Timing and discrimination of shock density in avoidance. *Psychol. Rev.* **79**:68-92, 1972.
- Gibbon, J. and Hunt, H. F.
Post-shock discriminations in the acquisition of free operant avoidance by rats. *Psychol. Rec.* **22**:151-159, 1972.
- Glassman, A. H.
Amine precursors in the treatment and study of affective disorders. *Proc. 7th Internat. Cong. Neuropharmacol.*, Prague, 1970. Bradley, P. B., ed., Elsevier, Amsterdam, 1972.
- Goodwin, F. K.; Murphy, D. L.; Dunner, D. L. and Bunney, W. E., Jr.
Lithium response in unipolar versus bipolar depression. *Am. J. Psychiat.* **129**:44-47, 1972.
- Gottesman, I. I. and Erlenmeyer-Kimling, L.
Prologue: A foundation for informed eugenics. *Social Biology* **18**:Suppl. S1-S8, 1971.
Eds. Differential reproduction in individuals with mental and physical disorders. *Social Biology Suppl.* Vol. 18, 1971.
- Gruenberg, E. M.
A 350 word prophecy. Cattell, J. P., ed. *Bull. N.Y.S. District Branches A.P.A.* **14**:7, 1972.
- Gruenberg, E. M.; Turns, D. M.; Segal, S. P.; Solomon, M.
Social breakdown syndrome: Environmental and host factors associated with chronicity. *Am. J. Pub. Health* **62**:1, 1972.

- Herz, M. I.
The therapeutic milieu: A critique. *Hosp. & Com. Psychiat.* **23**:3, 1972.
Views on the current role of psychiatric hospitalization. *Hosp. & Com. Psychiat.* **23**:7, 1972.
Who will care for the elderly? *Bull. N. Y. State District Branches A.P.A.* **1**:9, 1972.
- Herz, M. I.; Spitzer, R. L. and Endicott, J.
Research in the delivery of mental health. *Dis. Nerv. Sys.* **33**:7, 1972.
- Hunter, M.; Schucman, H. and Friedlander, G.
The retarded child from birth to five. John Day, New York, 1972.
- Inoue, K.; Graf, L. and Rapport, M. M.
Immunochemical studies of organ and tumor lipids XIX. Cytolytic action of antibodies directed against cytolipin R. *J. Lipid Res.* **13**:119-127, 1972.
- Jaffe, J.; Dahlberg, C. C.; Luria, J.; Breskin, S.; Chorosh, J. and Lorick, E.
Speech rhythms in patient monologues: The influence of LSD-25 and dextroamphetamine. *Biolog. Psychiat.* **4**:243-246, 1972.
- Jaffe, J.; Breskin, S. and Gerstman, L. J.
Random generation of apparent speech rhythms. *Language & Speech* **15**:68-71, 1972.
- Jarvik, L. F. and Blum, J. E.
Cognitive declines as predictors of mortality in twin pairs: A twenty-year longitudinal study of aging. In: *Prediction of Life Span*. Palmore, E. and Jeffers, F. C., eds. D. C. Heath & Company, Lexington, Mass. 1971.
- Jarvik, L. F.; Blum, J. E. and Varma, A. O.
Genetic components and intellectual functioning during senescence: A twenty-year study of aging twins. *Behav. Genet.* **2**:159-171, 1972.
- Jarvik, L. F.; Yen, F. S.; Fleiss, J.; Kato, T. and Moralishvili, E.
Chromosome measurements in aged monozygotic twins. *Hum. Hered.* **21**:557-576, 1971.
- Kanzler, M.
L-Dopa for the treatment of depression. In: *L-Dopa and Behavior*. Malitz, S., ed. Raven Press, New York, 1972.
- Katz, S.; Kornfeld, D. S.; Harris, P. D. and Yeoh, C. B.
Acute gastrointestinal ulceration with open-heart surgery and aortic valve disease. *Surgery* **72**:438-442, 1972.
- Kestenbaum, C. J.; Stone, M. H.; Forest, D. and Greenspan, K.
The psychiatrist faces the board examination. *Psychiatry*, November, 1972.
- Kline, N. S. and Baer, L.
Pharmacology of the commonly used therapeutic agents: Psychotropic Drugs. *N.Y.S. Jour. Med.* **72**:2170-2174, 1972.
- Kolb, L. C.
Year Book of Psychiatry and Applied Mental Health. Eds. Bond, D. C., Braceland, F. J., Freedman, D. X., Friedhoff, A. J., Kolb, L. C. and Lourie, Mrs. R. S. Year Book Med. Pub. 1971.
- Oscar K. Diamond 1911-1970. In Memoriam. *Am. J. Psychiat.* **128**:149, 1971.
- Preface. *The Psychiatric Interview in Clinical Practice*. MacKinnon and Michaels, R., eds. W. B. Saunders, Philadelphia, 1971.
- Violence and aggression. An overview. In: *Dynamics of Violence*. Faucett, J., ed. Am. Med. Assn., 1971
- Foreword. Challenge to Community Psychiatry: A dialogue between two faculties. Foley, A. R., ed. Behavioral Publications, 1972.
- Kopeloff, L. M. and Alexander, G. J.
Mechanism of p-chlorophenylalanine-mediated increase in seizure susceptibility: Inhibition by cerebellar ablation. *Proc. Soc. Exptl. Biol. Med.* **139**:647-651, 1972.
- Kornfeld, D. S.
The hospital environment, its impact on the patient. In *Advances in Psychosomatic Medicine VIII*. Lipowski, S., Karger, A. G., eds. Basel, 1972.
- Laragh, J. H.; Baer, L.; Brunner, H. R.; Buhler, F. R.; Sealey, J. E. and Vaughan, D. Jr.
Renin, angiotensin and aldosterone system in pathogenesis and management of hypertensive vascular disease. *Am. J. Med.* **52**:633-652, 1972.
- Laine, R.; Sweeley, C. C.; Li, Yu-Teh; Kisic, A. and Rapport, M. M.
On the structure of cytolipin R, a cera mide tetrahexoside hapten from lymphosarcoma. *J. Lipid Res.* **13**:519-524, 1972.
- Lawler, H. C.; Alexander, G. J.; Toscano, S.; Dean, L.; Machiz, S. and Whittingham, W.
Narcotics, including methadone, in tissues: Survey of quantitative assays. *Abs. Fed. Proc.* **31**:878, 1972.
- Levitt, M.
The effect of rubidium, lithium and sodium chloride on peripheral norepinephrine metabolism. *Psychopharmacol. Bull.* **8**:16, 1972.
The measurement of tyrosine hydroxylase activity. In: *The Thyroid and Biogenic Amines*. Rall and Kopin, eds. North-Holland Pub. Co. 1952.
- Malitz, S.
L-Dopa and Behavior. Raven Press, New York, 1972.
- McIlwain, D. L.; Graf, L. and Rapport, M. M.
Membrane fragments from myelin treated with different detergents. *J. Neurochem.* **18**:2255-2263, 1971.
- Mendlewicz, J.; Fieve, R. R.; Rainer, J. D. and Fleiss, J. L.
Manic-depressive illness: A comparative study of patients with and without a family history. *Brit. J. Psychiat.* **120**:523-530, 1972.
- Mendlewicz, J.; Fieve, R. R.; Stallone, F. and Fleiss, J. L.
Genetic history as predictor of lithium response in manic-depressive illness. *Lancet* **1**:599-600, 1972.
- Michels, R.
Training for a pluralistic psychiatry. *Int. J. Psychiat.* **10**:37-39, 1972.

- Moorhead, P. S.; Jarvik, L. F. and Cohen, M. M.
Cytogenetic method for mutagenicity testing. In: *Drugs of Abuse: Their Genetic and Other Chronic Nonpsychiatric Hazards*. Epstein, S. S., ed. MIT Press, Cambridge, Mass., 1971.
- Perel, J. M.; Israili, Z. H. and Cunningham, R. F.
Metabolism of probenecid, a n-dipropyl-sulfonamide. *Federation Proc.* 31:560, 1972.
- Perel, J. M.; Dawson, D. K.; Dayton, P. G. and Goldberg, L. I.
 $\alpha\alpha'$ and $\beta\beta'$ -deuterium labeled depamine. Synthesis and pharmacologic actions. *J. Med. Chem.* 15:714-716, 1972.
- Perel, J. M.; Kanzler, M. and Glassman, A. H.
Predictions of steady-state plasma levels of imipramine by using other model drugs. *Psychopharmacol. Bull.* June 6, 1972.
- Perel, J. M.; Finster, M.; James, L. S. and Mark, L. C.
Tissue thiopental concentrations in the fetus and newborn. *Anesthesiology* 36:155-158, 1972.
- Perel, J. M.; Chenkin, T.; Moses, D. and Wiener, M.
Inhibition of thromboplastin activity in plasma by aluminosilicate treatment. *Thrombos, Diathes, Haemorrh.* 28:135-143, 1972.
- Perel, J. M.; Brand, L.; Heiber, S. and Mark, L. C.
Effect of methylphenidate on rate of disappearance of thiopental from plasma. *Clin. Res.* XX:411, 1972.
- Polatin, P.
Patient resistance to lithium carbonate prophylaxis. *J. Am. Med. Assn.* 218:6, 1971.
The psychological aspects. In: *Plastic and Reconstructive Surgery of the Face and Neck*. Conley and Dickinson, eds. Vol. 1, George Thieme Verlag, Stuttgart, Germany, 1972.
Lithium carbonate prophylaxis in affective disorders (clinical versus research applications). *Dis. Nerv. Sys.* 33:7, 1972.
- Potegal, M.
Caudate nucleus localization system. *Acta Neurobiologiae Experimentalis* 32:479-494, 1972.
- Rainer, J. D.
Chronological parameters, twin studies, and mental diseases. *Acta Genet. Med. Gemellol.* 20:359-372, 1971.
Group therapy at the New York State Psychiatric Institute. In: *The Use of Group Techniques with Deaf Persons*. Schein, J. and Naiman, D., eds. New York Univ. School of Ed. New York, 1971.
Genetics and psychiatry. In: *Human Behavior, Biological, Psychological and Sociological*. Freedman, A. and Kaplan, H., eds. Atheneum, New York, 1972.
- Rainer, J. D.; Abdullah, S. and Jarvik, L. F.
XXX karyotype in a pair of monozygotic twins: A 17-year life-history study. *Brit. J. Psychiat.* 120:543-548, 1972.
- Rainer, J. D. and Altshuler, K. Z.
Expanded Mental Care for the Deaf: Rehabilitation and Prevention. U. S. Department of Health, Education, and Welfare, Social and Rehabilitation Service, Washington, D. C., 1972.
- Psychiatry for deaf persons: General survey and New York State program. In: *Deafness*, Vol. II. Norris, A. G., ed. Professional Rehabilitation Workers with the Adult Deaf, Silver Springs, Md., 1972.
A psychiatric program for the deaf. In: *Current Psychiatric Therapies*, Vol. 12. Masserman, J. H., ed. Grune & Stratton, Inc., New York, 1972.
- Razin, S.; Chanock, R. M.; Graf, L. and Rapport, M. M.
Immunogenicity of cytolipin H aggregated with *Acholeplasma laidlawii* membrane proteins. *Proc. Soc. Exptl. Biol. Med.* 138:404-407, 1971.
- Rieber, R. W.; Breskin, S. and Jaffe, J.
Pause time and phonation time in stuttering and cluttering. *J. Psycholing. Res.* 1:149-154, 1972.
- Robin, A. A. and Hakki, A.
Use of hospital beds in neighboring East London boroughs. *Psychol. Med.* 2:176-184, 1972.
- Roizin, L.
Histopathologic observations in schizophrenia (including effects of somatic and biochemical therapies). In: *Pathology of the Nervous System*. McGraw-Hill, N. Y. C. 3:2670-2677, 1972.
- Roizin, L.; Helpern, M.; Baden, M.; Kaufman, M. A.; Hashimoto, S.; Liu, J. C. and Eisenberg, B.
Neuropathology of drug dependence. In: *Chemical and Biological Aspects of Drug Dependence*. Mule, S. J. and Brill, H., eds. CRC Press Cleveland 389-411, 1972.
- Roizin, L.; Jervis, G.; Kaufman, M. A.; Popovitch, E. and Hashimoto, S.
Senile plaque pathogenesis in Down's, Alzheimer's and senile diseases. *J. Neuropath. and Exptl. Neurol.* 31:188, 1972.
- Roizin, L.; Liu, J. C.; Hashimoto, S. and Avrin, S.
Methadone effects on the central nervous system Golgi complex. *Abs. Fed. Proc.* 31:665, 1972.
- Schoenberg, B.
Le role futur de la formation psychiatrique dans la distribution des services de sante. *Medecine et Hygiene* 1018:1968-69, 1972.
- Schoenberg, B. and Carr, A.
Educating the health professional in the psychological care of the terminally ill. In: *Psychosocial Aspects of Terminal Care*. Columbia University Press, 1972.
- Schoenberg, B.; Carr, A.; Kutscher, A. and Peretz, D., eds.
Psychosocial Aspects of Terminal Care. Columbia University Press, 1972.
- Sherman, M. H.; Blair, A.; Parker, S.; Platt, R. and Schomer, J.
Some dimensions of style in family therapy. *Psychother.: Theory & Pract.* 9:67-75.
- Smith, K. W.
Accountability in mental health training programs: The outpatient patient-consumer and client. *Proc. of Ninth Ann. Mtg. of Psychiat. Outpatient Centers of Amer.* Tulipan, A. B. and Cutting, A. R., eds. 33-40, 1972.

- Srole, L.
Urbanization and mental health: A reformulation. *American Scientist*, 1972.
- Srole, L. and Fischer, A. K.
The social epidemiology of smoking behavior: The midtown Manhattan study. In: *Smoking Behavior: Motivations and Incentives*. Dunn, W., ed. Winston and Sons, Washington, D. C., 1972.
- Srole, L. and Schrijvers, J.
Geel research project studies of patients. *Netherlands J. of Psychiat.* 1972.
- Stokman, C. L. J.; Orlowsky, W. and Glusman, M.
Comparison of aversive thresholds in cats obtained by the methods of titration and constant stimuli. *Psychonomic Science*. 26-1-3, 1972.
- Stone, M. H.
Problems in treating the wealthy and their children. *Int. J. Child Psychother.* 1:15-46, 1972.
- Swiller and Forester, B.
Transexualism. *Int. J. of Group Psychother.* 1972.
- Swiller; O'Brien; Forester and Strange
Drug use patterns and demographic correlates among military psychiatric patients. In: *Drug Addiction, Clinical & Socio-Legal Aspects*. Futura Publishing Co., Mt. Kisco, N. Y., 1972.
- Tamir, H.; Kaufman, H. and Rapport, M.
Subcellular distribution of pyruvate kinase in cerebral cortex. *J. Neurochem.* 19:1759-1768, 1972.
Gryphon Press, 217-219, 1971.
- Thetford, W. N.
A critique of the Holtzman inkblot technique. In: *Personality Tests and Reviews*. Buros, O. K., ed. The
- Thetford, W. N. and Schucman, H.
Personality traits in adolescent adjustment reactions. *Psychol. Reports*. 31:591-598, 1972.

Public Health

JOHN H. BRYANT

Professor and Chairman of the Department

The School of Public Health is continuing to pursue the changes needed to improve the quality and relevance of its academic programs. There have been major changes in the structure, content and capability for evaluation of educational programs; there have been substantial additions to the faculty, particularly in the area of health services administration; and, largely through close association with the Center for Community Health Systems, several major research projects relating to health care delivery have been initiated.

Examining these changes in more detail, "Administrative Medicine" was dropped from the name of the School permitting it to revert to the simpler, but equally embracing title, School of Public Health, which has been used from 1945 to 1955. Admission requirements have been tightened beginning with the class entering in the fall of 1972, and the Admissions Committee was reorganized to include broader faculty-student input to the admission review process. The degree structure and related educational programs were reviewed by a specially constituted committee, and recommendations were made and approved by the Faculty Council of the Faculty of Medicine to strengthen the Master of Public Health degree (MPH) awarded by the School by requiring 3 semesters of academic work (instead of two) and at least one semester of practical experience. The academic sequence for the MPH would provide students with a common core of public health subjects, several elective courses, and with opportunity to concentrate in one or a combination

of specific educational tracks. The lengthened academic sequence will affect students entering in 1973.

A major innovation has been the development of a joint program with the Graduate School of Business aimed at providing the educational preparation needed to administer large and complex health care facilities and organizations. Under this program students majoring in health administration will be able to earn two degrees, the MPH and the MBA, by taking the required courses of the Graduate School of Business in addition to the health administration curriculum and a year of administrative residency through the School of Public Health. The first students will enter this program in January, 1973.

Another important initiative has been the work of the Student-Faculty Committee on Educational Program Evaluation. Faculty and students accepted the committee's first recommendations to introduce a questionnaire to be answered by students in each course as an experiment in course evaluation. Later efforts will be directed toward evaluating clusters of courses, tracks, and the overall educational program of the School.

Administrative responsibilities within the School have been reallocated with important functions going to Dr. Elinor F. Downs as Assistant Director of the School for Academic Affairs and to Professor Anna Gelman as Director of Student Affairs. These functions are in addition to their contributions to the ongoing work of their respective divisions. Mr. Clarence Teng, formerly Project Director

of the Corrections and Program Budgeting Projects at the New York Rand Institute, joined the faculty as Assistant Director of the School for Administration and Assistant Professor in the Division of Health Administration.

Faculty

New Appointments

Henry L. Barnett, M.D., Visiting Professor of Public Health (Epidemiology); Harold Baumgarten, Jr., Lecturer; Lowell E. Bellin, M.D., Professor of Public Health (Health Administration); Robert S. Bloom, Ph.D., Instructor in Public Health (Public Health Education); Stanley Budner, Ph.D., Associate Professor of Public Health (Sociomedical Sciences); Joseph A. Cimino, M.D., Lecturer; Noreen M. Clark, Instructor in Public Health (Health Administration); W. Wayne Curtis, Staff Associate in Public Health (Health Administration); Earland Cyrus, M.D., Associate in Public Health (Health Administration); Morton A. Fisher, D.D.S., Adjunct Associate Professor of Public Health (Health Administration); Seth B. Goldsmith, Sc.D., Assistant Professor of Public Health (Health Administration); Susan Goodfriend, Instructor in Public Health (Health Administration); Sheila A. Gorman, Senior Staff Associate in Public Health (Health Administration); Robert H. Hamlin, M.D., Adjunct Professor of Public Health (Health Administration); Alden Hammerling, Instructor in Public Health (Health Administration); Virginia R. Hannon, Sc.D., Lecturer; Donald W. Helbig, M.D., Assistant Professor of Public Health (Health Administration); Nathan Lefkowitz, Ph.D., Lecturer; H. Skipton Leonard, Research Associate in Public Health (Environmental Health Sciences); Paul S. May, D.Sc., Lecturer; Bess I. Miller, Staff Associate in Public Health (Public Health Nutrition); Lida Orzek, Ph.D., Research Associate in Public Health (Epidemiology); Dhun B. Patel, Ph.D., Assistant Professor of Public Health (Environmental Health Sciences); Marcia L. Pinkett, Instructor in Public Health (Health Administration); Dorothy M. Roels, M.D., Adjunct Assistant Professor of Public Health (Health Administration); Constance C. Rogers, Associate in Public Health (Health Administration); Pedro Rosso, M.D., Adjunct Assistant Professor of Public Health (Public Health Nutrition); Theresa E. Russell, Instructor in Public Health (Health Administration); Gerhart H. Saenger, Ph.D., Senior Research Associate in Public Health (Epidemiology); Wolf Szmunes, D.Phil., D.Med. Sci., Lecturer; Carol R. Tarica, Staff Associate in Public Health (Sociomedical Sciences); Clarence Teng, Assistant Professor of Public

Health (Health Administration); Caron Todd, Staff Associate in Public Health (Sociomedical Sciences); Geraldine Ann Widmer, Staff Associate in Public Health (Health Administration).

Promotions and Changes of Appointment

Margery M. Braren, Ph.D., from Research Associate in Sociomedical Sciences to Assistant Professor of Public Health (Sociomedical Sciences); Ann F. Brunswick, from Research Associate in Sociomedical Sciences to Senior Research Associate in Public Health (Sociomedical Sciences); Bernard D. Challenor, M.D., from Assistant Professor of Epidemiology to Associate Professor of Public Health (Epidemiology); Joseph L. Fleiss, Ph.D., from Adjunct Assistant Professor of Biostatistics to Adjunct Associate Professor of Public Health (Biostatistics); Allen S. Ginsberg, Ph.D., from Adjunct Assistant Professor of Health Administration to Associate Professor of Public Health (Health Administration); Natalie Goldart, from Assistant Professor of Community and Social Psychiatry (Psychiatric Social Work), to Lecturer; Paul W. Haberman, from Research Associate in Sociomedical Sciences to Senior Research Associate in Public Health (Sociomedical Sciences); David Harris, M.D., from Adjunct Assistant Professor of Public Health Practice, to Lecturer; Frank E. Iaquina, M.D., from Adjunct Assistant Professor of Administrative Medicine to Associate Clinical Professor of Medicine and Adjunct Associate Professor of Public Health (Health Administration); Michael Katz, M.D., from Professor of Tropical Medicine to Professor of Pediatrics and Professor of Public Health (Tropical Medicine); Frank V. Mount, M.D., from Senior Research Associate in Epidemiology to Adjunct Professor of Public Health (Epidemiology); Lloyd F. Novick, M.D., from Adjunct Assistant Professor of Health Administration to Assistant Professor of Public Health (Health Administration); Athilia E. Siegmann, from Assistant in Sociomedical Sciences to Assistant Professor of Public Health (Health Administration).

Resignations

Catherine Y. W. Ang, Ph.D., Research Associate in Public Health Nutrition; Gideon E. Livingston, Ph.D., Adjunct Professor of Public Health Nutrition; Jeanne C. Ridley, Ph.D., Associate Professor of Sociomedical Sciences; Betty Simons, M.D., Associate in Public Health Practice; Barbara Underwood, Ph.D., Assistant Professor of Public Health Nutrition; Ellaleen C. Williams, Instructor in Administrative Medicine.

Retirements

Morton D. Schweitzer, Ph.D., Professor of Epidemiology.

Died

J. Douglas Colman, Lecturer; Bion R. East, D.D.S., Professor Emeritus of Dental Public Health Practice; John E. Silson, M.D., Lecturer.

Dr. Lowell E. Bellin, previously First Deputy Commissioner of the New York City Health Department joined the resident faculty on February 1 as Professor of Public Health and Head of the Division of Health Administration. During the year, he was appointed to the Public Health Review Committee of the Bureau of Health Manpower Education of the United States Department of Health, Education, and Welfare. Seth B. Goldsmith, Sc.D., was appointed Assistant Professor of Public Health in charge of the Program in Health Services Administration, formerly known as the Program in Hospital Administration. He comes to us from Tulane University with special interests in public policy relating to smoking and in prison health care.

Allen S. Ginsberg, Ph.D., an engineer with doctoral education in systems analysis applied to health, previously an Adjunct Assistant Professor and Director of Health Projects of the New York Rand Institute, became a full-time faculty member as an Associate Professor of Public Health. Dr. Ginsberg is also Deputy Director of the Faculty of Medicine's Center for Community Health Systems of which Dr. John H. Bryant, Director of the School of Public Health, is the Director. Other additions to the faculty with joint responsibilities in the School and the Center include: Dr. Lloyd Novick, Assistant Professor of Public Health, previously Health Officer of the New York City Department of Health for Central Harlem and Washington Heights, who will work in the Center on the development of a child health care network; Dr. Nathan Lefkowitz, Lecturer in Sociomedical Sciences, who will focus his attention in the Center on a study of help-seeking behavior, and in the School on innovative approaches to health education; Dr. Robert S. Bloom, who is a specialist in health care task analysis and curriculum development.

Dr. Stanley Budner, a social psychologist, joined the Sociomedical Sciences faculty as an Associate Professor. Dr. Dhun Patel, formerly of the College of Pharmaceutical Sciences, was appointed Assistant Professor of Public Health in the Division of Environmental Health Sciences.

Dr. Bryant, in addition to his other duties, led teams of medical educators to Vietnam and Zaire (ex-Congo), to assist those countries in long-range

planning in health care and in the education of health personnel. Dr. Arne Barkhuus, Co-Director of the Program in Health Planning, was in Manila for one month as a consultant to the World Health Organization in preparation for the First Regional Conference on National Health Planning. Other faculty members also served abroad at some time during 1972. Dr. Frances Gearing was a member of a panel on Methadone Maintenance at the International Conference on Alcoholism and Drug Abuse in Amsterdam, Holland during her sabbatical leave in the fall term of 1972. Dr. Mervyn Susser and Dr. Zena Stein were consultants in epidemiology for the Pan-American Health Association, WHO, in Cuba.

Since July, Dr. Susser has been on sabbatical leave, to return at the start of the 1973-74 academic year. His functions as Head of the Division of Epidemiology, have been divided between two Co-Chairmen: Dr. Thomas Langner in charge of research and Professor Gelman, in charge of academic and intra-divisional affairs. Dr. Eric Josephson has been on sabbatical leave from the Division of Sociomedical Sciences studying the British pattern of teenage drug use and control at the University of Sussex in England.

Dr. A. Walter Hoover, Head of the Division of Environmental Health Sciences, is on a leave of absence for one year occupying the position of the first Director of Occupational Health Programs at the National Institute for Occupational Safety and Health in Washington. Dr. Granville H. Sewell is Acting Head of the division during his absence.

Dr. Michael Katz was appointed Professor of Pediatrics in addition to his present position as Professor of Public Health and Head of the Division of Tropical Medicine. He was appointed Short Term Consultant to the Pan-American Health Organization and in this capacity spent a week at the Instituto de Nutricion de Centro America Y Panama in Guatemala. Dr. Kathleen Hussey was elected Vice President of the New Jersey Society of Parasitology. Dr. Roger Williams was made a member of the Editorial Board of the Annals of the Entomological Society of America and Corporation Member of the Bermuda Biological Station for Research. Dr. Langner has been appointed to a Review Committee Center for Epidemiologic Studies at the National Institute of Mental Health and is a member of a Community Mental Health advisory body of the Human Resources Administration in New York City. Dr. David Rush was invited to become a member of the American Public Health Association's working group for a manual on community nutritional assessment. Professor Frank van Dyke

who returned on January 1 from a 2-year leave of absence as Director of the Mayor's Organizational Task Force for Comprehensive Health Planning was elected Chairman of the Medical Care Section of the American Public Health Association. Professor Virginia Brown was elected a member of the Board of Directors of the Public Health Association of New York City.

Teaching

An innovation in the teaching of the two basic courses in biostatistics for the general student body was introduced in the fall term of 1972. Students were sub-divided on the basis of a placement examination into four groups, each of which could proceed at a rate of learning appropriate to its members.

In the teaching in community and social psychiatry, greater stress is being placed on developing skills in mental health administration. A new elective seminar on psychological aspects of early family formation, was prepared and conducted by Dr. Viola W. Bernard and Mrs. Helene Schoenfeld. The public health-mental health curriculum for general students in the School of Public Health has been completely revised under the direction of Dr. Archie R. Foley, Director of the Division of Community and Social Psychiatry, and consists of a four course sequence covering emotions and the life cycle, concepts of community mental health-theory and practice, organization and delivery of community mental health services, and special problems including drug abuse, alcoholism, poverty and minority groups.

A Ph.D. program in epidemiology has been instituted. A graduate training program in psychiatric epidemiology has been established with Dr. DeWitt Crandell as Project Director, and Dr. Bruce Dohrenwend and Dr. Langner participating. A training development grant from the United States Public Health Service will make possible the establishment of an environmental quality management program to train policy-level personnel in environmental and health agencies.

The curriculum of the Division of Health Administration has been enriched by courses dealing in greater depth with finance, systems analysis, health maintenance organizations, health insurance, health legislation, and ambulatory care. A new 2-semester basic course in health administration, developed by Dr. Bellin, combines a case study approach with extensive reading; integrates organizational, administrative, sociological, political, fiscal, and ethical aspects of contemporary health issues; and emphasizes budgeting, quality and cost control of health services and grantsmanship.

Dr. Samuel M. Wishik, Professor of Public Health Practice and Director of the Division for Program Development and Evaluation of the International Institute for the Study of Human Reproduction, and his associate, Dr. Donald Helbig, have developed a new series of courses on population dynamics and family planning that, together with course sequences in maternal and child health form a track in the new MPH program.

An experimental course in health education is being developed by an inter-disciplinary group including Drs. Bryant, Budner, Harold Fruchtbau, Irving Shapiro, Bloom, Downs, Lefkowitz, and Mrs. Clark, assisted by an outside consulting firm. This course is the product of a year of inquiry into the problems and opportunities that face the field of health education. The course will involve students in a series of role playing simulations, each exhibiting important interactions between consumers and providers of health care in which an educational component might be identified and developed.

The Program of Continuing Education has intensified its focus on education of para-professionals, non-professionals and consumers through a federally funded consumer education grant. Four courses were planned in the late summer and fall of 1972 for ghetto area consumers in Central Harlem and Williamsburg, Brooklyn. Another major program emphasis has been in the area of drug abuse and dependence; three five-day workshops were held in the Spring and Fall of 1972, one in Philadelphia, one in New York City, and one in Pittsburgh. Other workshops, seminars and institutes offered during 1972 dealt with such subjects as: power, politics and planning in health; consultation and communication skills; physicians in industry; new trends in community health care; strategies for new health careers; interpersonal relations between patients and staff in nursing homes; expectant parent education; speech and hearing services for Spanish speaking families; and radiation protection. A total of 140 people participated in these programs offered in 1972.

Research

Division of Biostatistics

Dr. Agnes Berger, Associate Professor of Biostatistics, has continued working on the treatment of categorical data in collaboration with Dr. Ruth Z. Gold, Associate Professor of Education Teachers College. She has also been working on probabilistic models in the assessment of biologic variation with particular respect to fertility. Other members of the Division of Biostatistics have continued their studies on the design of experimenter

and statistical methods particularly appropriate to dental research, in addition to the continuing work on clinical trials in dental caries. These are being carried out by Drs. John W. Fertig, Andre Varma, and Neal W. Chilton.

Division of Environmental Health Sciences

The Division of Environmental Health Sciences continued its investigation on the detection of trace-metals and other environmental pollutants with Drs. Walter A. Hoover and Dhun Patel playing an active part. In addition, Mr. Paul Borsky and Dr. Leonard continued their work on noise pollution at John F. Kennedy International Airport.

Division of Epidemiology

The Epidemiology of Mental Retardation Research Unit (New York State Department of Mental Hygiene) under the direction of Dr. Stein, with the participation of Dr. Susser, is continuing the studies of the sequellae of the Dutch famine, 1944-45. Dr. Lillian Belmont is continuing her collaboration with Drs. H. G. Birch and S. A. Richardson of the Albert Einstein Medical School on a study among children of Aberdeen, Scotland, to determine the association between reading competence and various social and obstetrical indices. Dr. Holger Hansen has coordinated a study attempting to ascertain whether bio-chemical abnormalities resulting from an imbalanced phenylalanine metabolism of the mother produces developmental deficiencies in the fetus.

Following the suggestion of community representatives, a committee that included Drs. Stein and Saenger undertook a feasibility study of the adequacy of care provided for children with developmental disabilities coming to the attention of the Columbia-Presbyterian and Harlem Hospital Pediatric Clinics. Dr. Saenger and Robert Callahan are currently pursuing more detailed studies of the same question.

Dr. Langner and his unit are continuing their research in psychiatric impairment in urban children over time, and behavior and personality of mothers and children in welfare AFDC families.

Dr. Robert Friis is continuing his study of job satisfaction and health. Utilizing the Dutch Famine Study data, he is also examining social factors in intelligence and mental retardation.

The Prenatal Project, studying the effects of nutritional supplements during pregnancy on birth-weight and development in Harlem, under the direction of Dr. Rush, has proceeded well in the last year. Investigators on this project acted as

consultants for studies initiated in Washington, D.C., Yugoslavia, and Bombay, India.

Dr. Gearing has continued her research for the Methadone Maintenance Evaluation Unit.

The Epidemiology of Mental Disorders Research Unit (New York State Department of Mental Hygiene) under the direction of Dr. Elmer Struening, is continuing studies focused on the distribution of mental health and behavior characteristics of selected health areas of New York City.

Mrs. Inge Goldstein and Mrs. Gloria Block working with the Air Pollution Epidemiological Research Unit have been involved in the evaluation of air pollution data throughout New York City. Emergency Room visits for various respiratory diagnoses have been used as a Health Effect Index.

Division of Health Administration

Professors Brown, van Dyke, Regina Lowenstein, and staff have begun work on a study for the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), to compare aspects of care for enrollees in a Blue Cross-Blue Shield plan with those for enrollees in a Health Maintenance Organization. Work also began on a follow-up of the home health services study that had been completed this year.

Members of the Division of Health Administration are working as part of the Center for Community Health Systems (CCHS) on several studies: Dr. Bellin, is Project Director of a hospital cost control study that is coupled with the development of a prototype PSRO (Professional Services Review Organization). Professor Lowenstein is also a participant in this study. Drs. Bryant, Ginsberg, Lefkowitz and Professors Nora Piore, Lowenstein, and staff are pursuing a major study of the CCHS on emergency care services, which deals with unscheduled seeking for health care for both emergencies and non-emergencies.

Professors Piore, Lowenstein, and Drs. Novick, and Bryant, and staff, together with members of the Department of Pediatrics, are planning a joint CCHS-Pediatrics project on child health care in upper Manhattan.

In addition, Professor Piore is beginning a study of health expenditures and public policy in New York City, and Professor Lowenstein is beginning the development of a health fact book on upper Manhattan for health planners.

Drs. Goldsmith and Bloom are studying the roles of various levels of administrative positions in the health field with the purpose of developing relevant curricula at undergraduate and graduate levels.

Division of Sociomedical Sciences

A five year study of adolescent health in Harlem was completed by Mrs. Ann Brunswick and Dr. Josephson, the first such study done on a community basis. The report appeared as a special issue of the American Journal of Public Health, and provides background material for a conference to be held in Harlem early in 1973, sponsored by the Maternal and Child Health Service, Health Services and Mental Health Administration, U.S. Department of Health, Education, and Welfare.

Dr. John Colombotos completed his study of how the attitudes of physicians in New York State toward Medicare and other issues in the organization and delivery of health service change as legislation affecting these matters change. He is now expanding the study to a national sample including not only the attitudes of physicians in practice, but also attitudes of interns, residents and medical students.

Dr. Harriet Presser has been doing research on women's roles and fertility. In collaboration with Larry Bumpass of the University of Wisconsin, she worked on the demographic and social aspects of contraceptive sterilization in the United States for the Commission on Population Growth and the American Future. Dr. Moni Nag's project on economic cost and value of children in four societies was begun this year. Negotiations were made with various institutions in Indonesia, Nepal and Mexico for anthropological investigations related to the study.

Dr. Budner is continuing work on his project concerning correlates of abortion-seeking under a permissive law.

Drs. Jack Elinson and Josephson continue their investigation of teenage drug use in the United States with Mrs. Anne Zanes as project administrator and Mr. Paul Haberman as a participant. This important study is in its third year of a projected five. Mr. Haberman has also been involved in a study to determine the prevalence of alcoholism among decedents examined by the coroner in New York City. An international comparative exploratory study on decision making in the health field has

been launched by Dr. Jorge Segovia with the objective of developing methods for studying decision making.

Division of Tropical Medicine

Dr. Williams is conducting a study of matrone, an insect sterilant, as part of the investigation of biological methods for insect control. Dr. Dickson Despommier continued his study of functional antigens of *Trichinella spiralis*. Dr. John Frame is studying the epidemiology of cancer among missionaries in Nigeria and Ethiopia and has continued his studies on the effects upon the fetus of anti-malarial prophylaxis given to pregnant women. Together with Dr. Katz he received grants from World Health Organization and from Firestone Natural Rubber Company to study the epidemiology of lassa fever in West Africa.

Major Donors to the Training and Research Programs

The School of Public Health gratefully acknowledges the contributions to its programs from The Alfred P. Sloan Foundation, The Association for the Aid of Crippled Children, Faigel Leah Foundation, The Grant Foundation, Health Research Council for the City of New York, The Johnson Foundation, Metropolitan Life Insurance Co., Inc., Merck and Company, National Air Pollution Control Commission, National Cancer Institute, National Center for Health Services Research and Development, National Institute of Child Health and Human Development, National Institute of Dental Research, National Institute of Mental Health, National Aeronautics and Space Agency, New York State Narcotic Addiction Control Commission, Ruth and Herber Langner Foundation, United States Department of Defense, United States Department of Health, Education and Welfare, Maternal and Child Health Service, United States Department of Health, Education and Welfare, Public Health Service, United States Department of Health, Education and Welfare, Social and Rehabilitation Service, United States Department of Transportation, Van Ameringen Foundation, World Health Organization.

1972 Publications

Public Health

- Bellin, Lowell E.
Optometry: Future shock and present imperative. *J. Amer. Optom. Ass.* **43**:721-723, 1972.
- Bellin, Lowell E.; Kavalier, Florence and Schwarz, Al.
Phase one of consumer participation in policies of twenty-two voluntary hospitals in New York City. *Amer. J. Public Health* **62**:1370-1378, 1972.
- Bernard, Viola W.
Interracial practice in the midst of change. *Amer. J. Psychiat.* **128**:8, 1972.
- Braren, Margery and Elinson, Jack.
Relationship of a clinical examination to mortality rates. *Amer. J. Public Health* **62**:1972.
- Brunswick, Ann.
Adolescent health, sex and fertility. Abstract in: *Dokumentation, Sozialmedizin Oeffentlicher Gesundheitsdienst Arbeitsmedizin* (Federal Republic of Germany) **4**: 1972.
Whose generation gap? In: *Crowd and Mass Behavior*. Sociological Resources for the Social Studies, sponsored by the American Sociological Association, National Science Foundation. Allyn and Bacon, Inc., Boston, Massachusetts, 1972.
- Brunswick, Ann and Josephson, Eric.
Adolescent health in Harlem. Monograph Supplement to *Amer. J. Public Health*, 1-62, 1972.
- Canfield, Robert E. and Bryant, John H.
The role of the university in a changing health care system. *P&S Quarterly* (Columbia University College of Physicians and Surgeons) **17**:8-12, 1972.
- Causey, O. R.; Kemp, G. E.; Casals, J.; Williams, R. W. and Madbouly, M. H.
Dugbe virus, a new arbovirus from Nigeria. *Nigerian J. Sci.*, 1972.
- Causey, O. R.; Kemp, G. E.; Williams, R. W.; Madbouly, M. H.; David-West, Tam., S.; Lee, V. H. and Moore, D. L.
West African tick-borne viruses, 1964-1968. *Nigerian J. Sci.*, 1972.
- Challenor, B. D.; Hill, Barbara; Collins, J. A. and Wornum Betty.
Education in mental health. *HSMHA Health Rep.* **87**:351-355, 1972.
- Challenor, B. D.; Schermerhorn, J.; Collins, J. A.; Hill, Barbara; Wornum, Betty and Perlman, Nancy.
An educational program for allied health personnel. *Amer. J. Public Health* **62**:223-228, 1972.
- Challenor, B. D.; Wicks, J. and Lythcott, G. I.
Community medicine: An evolving discipline. *Ann. Intern. Med.* **76**:689-695, 1972.
- Chilton, Neal W. and Fertig, John W.
Pulpal responses of exploring bilateral intact teeth. *Oral Surg.* **33**:797-800, 1972.
- Dammann, Gloria L.
Interprofessional aspects of nursing and social work curricula. *Nurs. Res.* **21**:160-163, 1972.
- Day Care Council of New York.
Children at risk: The growing problem of child abuse. Seminar report, 1972. (Participants: Vincent Fontana, Thomas Becker, Elinor Downs, Aaron Rausen).
- Despommier, Dickerson D.
Immunogenicity of the newborn larva of *Trichinella spiralis*. *J. Parasit.* **57**:531-535, 1971.
- Despommier, D. D. and Jackson, G. J.
Actinomycin and puromycin — Hcl in axenic cultures of the nematode, *Neoplectana glaseri*. *J. Parasit.* **58**: 774-777, 1972.
- Dohrenwend, Barbara S. and Dohrenwend, Bruce P.
Social class and the relation of remote to recent stressors. In: *Life History Research in Psychopathology*, Volume II, M. Pollak, L. Robins and M. Roff, eds., University of Minnesota Press, Minneapolis, Minnesota, 1972, pp. 170-185.
Psychiatric epidemiology: An analysis of 'true prevalence' studies. In: *Handbook of Community Psychology and Mental Health*. S. E. Golann and C. Eisdorfer, eds., Appleton-Century-Crofts, New York, New York, 1972.
- Elinson, Jack.
Effectiveness of social action programs in health and welfare. In: *Evaluating Action Programs: Readings in Social Action and Education*. C. Weiss, ed., Allyn and Bacon, Boston, Massachusetts, 1972.
Human factors in automated multiphasic health testing services. In: *Proceedings of the Invitational Conference on Automated Multiphasic Health Testing and Services* (January, 1970). U. S. Department of Health, Education and Welfare, Washington, D. C., 1972.
Book review. Interns: From students to physicians, by Emily Mumford. *Contemporary Soc.* 159-160, 1972.
Methods of sociomedical research. In: *Handbook of Medical Sociology*. H. Freeman, S. Levine and L. Reeder, eds., Prentice-Hall, Englewood Cliffs, New Jersey, 1972, second ed.
- Fertig, J. W.; Chilton, N. W. and Varma, A. O.
A multivariate analysis of bilateral pulp responses. *Arch. Oral Biol.* **17**:1255-1264, 1972.
- Flapan, Mark and Schoenfeld, Helene.
Procedures for exploring women's childbearing motivations, alleviating childbearing conflicts and enhancing maternal role development. *Amer. J. Orthopsychiat.* **42**, 1972.
- Fleiss, J. L.
Classification of depressive disorders by numerical typology. *J. Psychiat. Res.* **9**:141-153, 1972.
- Fleiss, J. L.; Spitzer, R. L.; Endicott, J. and Cohen, J.
Quantification of agreement in multiple psychiatric diagnosis. *Arch. Gen. Psychiat.* **26**:168-171, 1972.
- Foley, Archie R.
Pre-retirement planning in a changing society. *Amer. J. Psychiat.* **128**:877-881, 1972.

- Some critical issues in health care. *Psychiat. Dig.* **33**: 12-21, 1972.
- Friis, R. H. and Knox, A. B.
A validity study of scales to measure need achievement, need affiliation, impulsiveness, and intellectuality. *Educational Psychol. Meas.* **32**:147-154, 1972.
- Fruchtbaum, Harold.
Chance and necessity: An essay on the natural philosophy of modern biology. *The Sciences* **12**: 14-15, 32, 1972.
The coming of age. *The Sciences* **12**:15, 25, 1972.
Death and the biomedical sciences: Notes toward a statement of some problems. The Foundation of Thanatology, 1972.
A social ethics for technology. The New York Academy of Sciences, 1972.
- Gearing, F. R.
Deaths before, during and after methadone maintenance treatment in New York City. In: *Proceedings of the Fourth National Conference on Methadone Treatment*, San Francisco, California, 1972, p. 493.
Methadone maintenance — six years later. *Contemp. Drug Probl.* **1**:191-206, 1972.
People versus urines. In: *Proceedings of the Fourth National Conference on Methadone Treatment*, San Francisco, California, 1972, p. 325.
A road back from heroin addiction. In: *Proceedings of the Fourth National Conference on Methadone Treatment*, San Francisco, California, 1972, p. 157.
- Gearing, F. R.; Perera, G. and Schweitzer, M. D.
A family study of primary hypertension — final report. *J. Chronic Dis.* **20**:127-132, 1972.
- Goldsmith, Seth B.
The status of health status indicators. *HSHMA Health Rep.* **87**:214-220, 1972.
- Goldstein, I. F.
Interaction of air pollution and weather in the effects on health. *HSMHA Health Rep.* **87**:50-55, 1972.
- Gurland, B. J.; Fleiss, J. L.; Sharpe, L.; Simon, R. and Barrett, J. E.
The mislabeling of depressed patients in New York state hospitals. In: *Disorders of Mood*. Johns Hopkins Press, Baltimore, Maryland, 1972, pp. 17-28.
- Haberman, Paul W.; Josephson, Eric; Zanes, Anne and Ellinson, Jack.
High school drug behavior: A methodological report on pilot studies. In: *Proceedings of the First International Conference on Student Drug Surveys*. Stanley Einstein and Stephen Allen, eds., Baywood Publishing Co., Farmingdale, New York, 1972.
- Hartsook, Rosa; Bloom, Robert S. and Angus, Gwyn D.
Job descriptions in occupational therapy. *Amer. J. Occup. Ther.* Fall, 1972.
- Henderson, B. E.; Gary, G. W., Jr.; Kissling, R. E.; Frame, J. D. and Carey, D. E.
Lassa fever virological and serological studies. *Trans. Roy. Soc. Trop. Med. Hyg.* **66**:409-416, 1972.
- Hill, Barbara; Collins, Jerome A.; Challenor, Bernard D. and Wornum, Betty.
Health paraprofessionals for a model cities program: A review and evaluation two years after training. *Amer. J. Orthopsychiat.* **42**:272, 1972.
- Hilleboe, Herman E.; Barkhuus, Arne and Thomas, William, C., Jr.
Approaches to national health planning. Public Health Papers, No. 46. World Health Organization, Geneva, Switzerland, 1972, 108 pp.
- Hussey, Kathleen L.
A microsporidan hyperparasite of strigeoid trematodes, *Nosema strigeoideae* sp. n. *J. Protozool.* **18**: 676-679, 1971.
- Jarvik, L. F.; Blum, J. E. and Varma, A. O.
Genetic component and intellectual functioning during senescence — a 20-year study of aging twins. *Behav. Gen.* **2**:159-171, 1972.
- Josephson, E. Haberman, P. W.; Zanes, A. and Ellinson, J.
Adolescent marijuana use: Report on a national survey. In: *Proceedings of the First International Symposium on Student Drug Use*. Stanley Einstein and Stephen Allen, eds., Baywood Publishing Co., Farmingdale, New York, 1972, pp. 1-8.*
* Also in: *New York Law Journal* **167**:36-37, 1972.
- Katz, M. and Koprowski, H.
Subacute sclerosing panencephalitis, measles, rabies, and progressive multifocal leukoencephalopathy. In: *Proceedings of the Association for Research in Nervous and Mental Diseases*. L. P. Rowland, ed., Williams and Wilkins, Baltimore, Maryland, 1971, p. 373.
- Knapp, Sally E. and Lovejoy, Robert R.
Hospital Mergers in New England: Organizational Perspectives. Systems Educators, Inc., Durham, New Hampshire, 1972.
- Lindaman, Francis C.
Consumer participation in health delivery services: Help or Hindrance? Eastern Regional Workshop for Registered Nurses, Physicians, Educators and Pediatric Nurse Associate Programs. In: *Child Health Care in the '70s*. American Nurses Association, Kansas City, Missouri, 1972.
- Lindaman, Francis C. and Costa, Marjorie A.
The voice of the community. *Amer. J. Public Health* **62**:1245-1248, 1972.
- Mendlewicz, J.; Fieve, R. R.; Rainer, J. and Fleiss, J. L.
Manic-depressive illness: a comparative study of patients with and without a family history. *Brit. J. Psychiat.* **120**:523-530, 1972.
- Meulen, V. ter and Katz, M.
Slow and delayed measles virus infection as the cause of subacute sclerosing panencephalitis. In: *Proceedings of the International Congress of Pediatrics III/2* 1971, pp. 357-361.
- Meulen, V. ter; Katz, M.; Käckell, Y. M.; Barbanti-Brodano, G.; Koprowski, H. and Lennette, E.
Subacute sclerosing panencephalitis: *In vitro* characterization of viruses isolated from brain cells in culture. *J. Infect. Dis.* **126**:11-17, 1972.

- Meulen, V. ter; Katz, M. and Koprowski, H.
The role of measles virus in subacute sclerosing panencephalitis. In: *Proceedings of the XIIIth European Symposium of Poliomyelitis and Other Virus Diseases*, Helsinki, Finland, 1971.
- Meulen, V. ter; Katz, M. and Müller, D.
Subacute sclerosing panencephalitis: A review. In: *Current Topics in Microbiology and Immunology*, Springer-Verlag, Berlin-Heidelberg-New York, 1972 (57:1).
- Meulen, V. ter; Leonard, L. L.; Lennette, E. H.; Katz, M. and Koprowski, H.
The effect of 6-azauridine upon subacute sclerosing panencephalitis virus in tissue cultures. *Proc. Soc. Exp. Biol. & Med.* 140:1111-1115, 1972.
- Miller, Louis H.
The ultrastructure of red cells infected by *Plasmodium falciparum* in man. *Trans. Roy. Soc. Trop. Med. & Hyg.* 66:459-462, 1972.
- Miller, L. H.; Chien, S. and Usami, S.
Decreased deformability of *Plasmodium coatneyi*-infected red cells and its possible relation to cerebral malaria. *Amer. J. Trop. Med. & Hyg.* 21:133-137, 1972.
- Miller, L. H.; Fremount, H. N. and Luse, S. A.
Deep vascular schizogony of *Plasmodium knowlesi* in *Macaca mulatta*. Distribution in organs and ultrastructure of parasitized red cells. *Amer. J. Trop. Med. & Hyg.* 20:816-824, 1971.
- Müller, D.; Meulen, V. ter; Katz, M. and Koprowski, H.
Cytochemical evidence for the presence of two viral agents in subacute sclerosing panencephalitis. *Lab. Invest.* 25:335- , 1971.
- Nag, Moni
Sex, culture and human fertility: India and the United States, *Current Anthropology* 13:231-237, 1972.
- Presser, Harriet B.
Feminism and the status of women. *Fam. Planning Perspectives* 4:59-61, 1972.
Voluntary sterilization: A world view. In: *Reports on Population/Family Planning*. The Population Council and the International Institute for the Study of Human Reproduction, New York, New York, 1970; excerpt in *Devel. Dig.* 10:35-40, 1972.
- Presser, Harriet B. and Bumpass, Larry L.
The acceptability of contraceptive sterilization among U. S. couples: 1970. *Fam. Planning Perspectives* 4: 18-26, 1972.
Contraceptive sterilization in the U. S.: 1965-1970. *Demography* 9:531-548, 1972.
- Rabkin, J. G.
Opinions about mental illness: A review of the literature. *Psychol. Bull.* 77:153-171, 1972.
- Richardson, A. and Freeman, H.
Evaluation of medical care utilization by interview surveys. *Med. Care*: 10:357-362, 1972.
The impact of extended insurance benefits on octogenarian medical experience. *Soc. Science Med.* 5: 375-390, 1972.
- Rush, D. and Kass, E. H.
Maternal smoking: A re-assessment of the association with perinatal mortality. *Amer. J. Epidem.* 96:183-196, 1972.
- Santamauro, A. G.; Sciarra, J. J. and Varma, A. O.
A clinical investigation of the role of semen analysis and post-coital test in the evaluation of male infertility. *Fertil. Steril.* 23: 245-51, 1972.
- Shookhoff, Howard B.
Protozoa and diseases. In: *Pediatrics*. Henry L. Barnett, ed. 15th ed.
- Smith, F. Rees; Underwood, B. A.; Denning, C. R.; Varma, A. O. and Goodman, deWitt.
Depressed plasma — retinol binding protein levels in cystic fibrosis. *J. Lab. Clin. Med.* 80, 1972.
- Stein, Z. A. and Susser, M.
The Cuban health system: A trial of comprehensive service in a poor country. *Int. J. Health Sci.* 1972.
- Stein, Z. A.; Susser, M.; Saenger, G. and Marolla, F.
Impact of the World War II famine on intellectual development in the Netherlands. *Science* 178, 1972.
Intelligence test results of individuals exposed during gestation to the World War II famine in the Netherlands. *Tijdschrift voor Sociale Geneeskunde*. The Netherlands, 50:766-774, 1972.
- Susser, M. (ed.)
Causal Thinking in the Health Sciences. Oxford University Press, New York, 1972.
Procedures for establishing causal associations. In: *Trends in Epidemiology: Application to Health Service Research and Training*. G. T. Stewart, ed., C. C. Thomas, Springfield, Illinois, 1972, pp. 23-100.
Socio-economic factors of population and society. In: *Workshop Papers of the Fourth World Conference on Medical Education*, Copenhagen, Denmark, 1972, pp. 53-61.
- Susser, M.; Marolla, F. A. and Fleiss, J.
Birthweight, fetal age and perinatal mortality. *Amer. J. Epidem.* 96:197-204, 1972.
- Szmunn, W.; Prince, A. M.; Brotman, B. and Hirsch, R. L.
The epidemiology of hepatitis B virus infection in blood donors. In: *Hepatitis and Blood Transfusions*. Grune & Stratton, New York, N. Y., G. N. Vyas, ed., p. 299-307, 1972.
- Tijl, W. J. F.; Nottermans, S. L.; Katz, M.; Meulen, V. ter and Koprowski, H.
Clinical and electroencephalographic aspects; SSPE virus encephalitis produced in young dogs. *Proc. Cong. Pediat.* II/2:425, 1971.
- Wasserman, B. H.; Geiger, A. M. and Turgeon, Livia R.
Relationship of occlusion and periodontal disease, III and IV. *J. Period.* 43:540-550 and 551-561, 1972.
- Williams, Roger W.
Trombiculosis, cutaneous myiasis, scabies, pediculosis, necrotic arachnidism, tick paralysis. In: *Infectious Diseases, A Modern Guide to Diagnosis and Management of Infectious Processes*. P. D. Hoeprich, ed., Hoeber Medical Division, Harper & Row Publishers, Inc., New York, New York, 1972.

Williams, R. W.; Causey, O. R. and Kemp, G. E.

Ixodid ticks from domestic livestock in Ibadan, Nigeria as carriers of viral agents. *J. Med. Ent.* 9:443-445, 1972.

Wishik, S. M.

1) Considerations in the development of national goals; and

2) What are the requirements for acceptance of family planning programs? In: *Proceedings of the Western Hemisphere Nutrition Congress*, III, 1972.

Evaluation of fertility reduction effectiveness of family planning programs by correlation of estimated fertility changes with estimated amounts of contraceptive practice. Presented at and distributed by the United Nations Technical Meeting, Population Division, United Nations, Budapest, Hungary, 1972.

Nutrition, family planning and fertility. *Proceedings of the Protein Advisory Group*, United Nations, 1972.

Wishik, S. M. and Helbig, Donald W.

The fertility pattern method: Estimation of fertility change by retrospective quasi-cohort analysis of group specific fertility patterns. International Institute for the Study of Human Reproduction, Division for Program Development and Evaluation, New York, New York, 1972.

Wishik, S. M.; Shimmel, Julia and Ramaprasad, Rukmani.

A study of family planning service and distribution patterns in selected areas of New York City and factors affecting clinic attendance. International Institute for the Study of Human Reproduction, Division for Program Development and Evaluation, New York, New York, 1972.

Radiology

WILLIAM B. SEAMAN

Professor and Chairman of the Department • Director of Service

Introduction

The continued escalation of the demand for radiological services continues to overwhelm the equipment, space and staff of the Department of Radiology. This growth in utilization stems from a variety of causes; the increased awareness of their clinical value in establishing and confirming a suspected diagnosis and the development of new procedures and techniques. Included in the latter category are mammography, magnification and subtraction techniques, super selective arteriography, coronary arteriography and new scanning techniques utilizing radioactive materials. The question has been raised as to whether all of these studies are really necessary. Do they alter the management of the patient's disease or contribute to betterment of his condition. Interest has been focussed on cost-benefit ratios. Does the benefit obtained warrant the cost in dollars and in patient radiation dose. This is obviously a difficult problem which has recently begun to interest the American College of Radiology, and several governmental agencies. Several pilot research programs on this subject are already being carried out by the Radiology Department.

Staff Changes

Drs. Bentley Hollander, Stuart Fuld, Charles Feuer and Henry Fischer resigned to enter private practice. The department was strengthened by the addition of Drs. Harry Morgan, Peter Livingston, Kenneth Jewel, Shelby Galloway and Edward Pol-

lock, former residents who became members of the attending staff. Dr. Bruce Wiley joined the attending staff at the Neurological Institute and Dr. Chong and Dr. Ira Horowitz joined the radiotherapy attending staff.

Frank Gonzalez, a member of the Radiation Research laboratory, died in September.

Dr. H. Texidor, staff radiologist at the Francis Delafield Hospital, resigned and was replaced by Dr. Leroy S. Safian.

Teaching Activities

Over two hundred physicians attended a postgraduate course in the radiology of the gastrointestinal tract organized by Dr. William B. Seaman. Dr. Frieda Feldman's postgraduate course in bone and joint radiology continues to be well attended. Courses in radiobiology and radiologic physics were given by Dr. Eric Hall. There were almost a hundred registrants in Dr. Guy D. Potter's and Dr. Stephen Trokel's course on the radiology of the orbits.

Dr. Hilal organized and conducted the yearly research symposium of the Association of University Radiologists held in Glen Cove, Long Island. The topic was small vessel angiography and was attended by some fifty participants from the United States and Europe.

Staff Activities

Dr. William B. Seaman gave the Preston W. Hickey Lecture of the Michigan Radiological So-

ciety and was named president-elect of the American Roentgen Ray Society, a national organization of almost 2000 radiologists from the United States and Canada. He also became the president-elect of the Society of Gastro-intestinal Radiologists. He continues as Chairman of the Radiology Committee of the National Academy of Sciences, National Research Council, as a member of the Part III Committee of the National Board of Medical Examiners and guest-examiner of the American Board of Radiology.

Dr. Kent Ellis continues as member of the Publication Committee of the American Roentgen Ray Society and member of the Executive Committee of the Faculty Council of the College of Physicians and Surgeons. He is a founding member of the Council on Cardio-vascular Radiology of the American Heart Association and a member of the Task Force on Community Resources for Cardio-vascular Care of the New York Heart Association.

Dr. Harald Rossi continued his work as Chairman of the Technical Advisory Committee on Radiation for the Mayor of the City of New York. He is a member of the Main Commission of the International Commission on Radiation Units and Measurements and of the Board of Directors of the National Council on Radiation Protection and Measurements. He is also Chairman of the Advisory Committee on Radiation Biology Aspects of the Supersonic Transport.

Dr. Albrecht Kellerer continued to serve on the Main Commission of the International Commission on Radiation Units and a Committee on "Fundamental Quantities and Units" of the same International Commission. Dr. Eric Hall served on the Radiobiological Advisory Panel to NASA.

Dr. Philip Johnson continues to serve on the Subcommittee on Human Administration of Radioactive Materials of the Mayor's Committee on Radiation. He is President of the Greater New York Area Chapter of the Society of Nuclear Medicine, and Vice chairman of the Program Committee of the Society of Nuclear Medicine.

Research Activities

Dr. Kent Ellis, with Dr. Conrade Jaffe, and Dr. D. Schmidt (Medicine) are studying the roentgenographic and angiocardigraphic manifestations of infective endocarditis. With Drs. Carl Steeg and Welton Gersony (Pediatrics), Dr. Ellis is studying ventricular septal defect in total anomalous pulmonary venous connection. An evaluation of the indication for chest tomography is being conducted by Dr. Harry Morgan and Dr. Kent Ellis. Lymphan-

gioma of the lung is being reviewed by Dr. Ellen Silverstein and Dr. Marianne Wolf of the Department of Surgical Pathology. Dr. Donald King, Dr. Conrade Jaffe and Dr. Kent Ellis are measuring ventricular and atrial volumes with ultrasonic techniques. An evaluation of coronary artery disease in the presence of systemic hypertension is being carried out by Dr. Kent Ellis, Dr. William Casarella, with Dr. Donald Schmidt, Dr. Charles Steiner and Dr. Paul Cannon (Medicine). Dr. Kent Ellis and Dr. D. Schmidt (Medicine) are studying the relationships between pressures on the right and left sides of the heart to the configuration of the atrial and ventricular septa.

Dr. Philip Sorabella and Dr. William B. Seaman have devised a radiological technique for the detection of enlargement of the body and tail of the pancreas. This is being tested using autopsy and clinical material. Dr. William Campbell and Dr. Robert Waldron are continuing to develop techniques for reflux pancreatography.

Drs. Walter Berdon and David Baker are studying the use of magnification techniques and transverse fluoroscopy in the evaluation of disease in children.

Dr. Guy Potter investigated the radiological procedures used to detect diseases of the salivary glands. He continues to evaluate the radiologic method of detecting the effects of trauma to the ear.

Dr. Ernest H. Wood and Dr. James W. Correll are continuing an investigation on the utilization of facial thermography for the evaluation of patients with occlusive vascular disease in the neck and their follow-up after endarterectomy. Also, in conjunction with Dr. Arnold P. Friedman, Dr. Wood is studying cluster headache with facial thermography during and after attacks.

Dr. Sadek K. Hilal, under a grant from the NIH, has continued developing the magnetic intravascular navigation of the POD catheter. Dr. Hilal, in conjunction with Dr. Richard Penn and Dr. Jost Michelsen (Neurological Surgery), used the POD catheter for developing a technique of recording the electroencephalogram from the deep aspects of the brain, such as the medial surface of the temporal lobe, in the baboon. The technique was later used on patients. The intravascular route permits reaching those areas of the brain that are difficult to monitor with the conventional electroencephalogram. It is hoped that this approach may be useful in the detection of deep-seated seizure foci.

Dr. Hilal, in association with Drs. Penn and Michelsen, investigated a variety of vascular "glues" in animals for the purpose of obliterating abnormal

vascular beds. Using the magnetically guided catheter, it was possible to obliterate small branches of the renal artery in the dog in a highly selective fashion. The glues under investigation are radioactive liquid materials which solidify on contact with blood.

Dr. Hilal, in conjunction with Dr. Bruce E. Wiley and Dr. Richard Holgate, conducted a program for the pre-operative embolization of vascular tumors of the base of the skull and of the spine. Glomus jugulare tumors, nasopharyngeal angiofibromas, giant cell tumors of the skull and spine, and vascular meningiomas were successfully embolized, thus markedly facilitating subsequent surgery.

The program of percutaneous embolization of cerebro-arteriovenous malformations was continued this year to include Dr. Hilal, Dr. Wiley, Dr. Michelsen, Dr. Paul Cannon and Dr. Philip Johnson. The routine usage of the regional cerebral blood flow technique with intra-arterial radioactive Xenon injections and the Gamma Camera was introduced for the quantitative evaluation of therapeutic embolization.

The regional cerebral blood flow effort is continuing as part of the Hypertension Center activity with Dr. Hilal, John Brust, Paul Cannon and Philip Johnson participating.

In conjunction with Dr. Hugo Keim (Orthopedic Surgery) and Dr. Robert Lovelace, Dr. Hilal has done spinal angiography and spinal venography on the rhesus monkey to study the vascular anatomy of the spine. The effect of the selective injection of contrast media in the radicular spinal artery on the physiology of the spinal cord was also studied.

Dr. Hilal, in conjunction with Dr. C. K. Chow from the IBM Research Laboratory, has developed a technique of computer-aided subtraction of radiographic images, which makes possible regional enhancement of image detail in limited areas of the film.

Dr. Robert L. Waldron and Dr. Edward W. Dempsey (Anatomy) have been collaborating on research involving the study of the effect of intravascular radiographic contrast media at the cellular level in the brain using the electron microscope.

Dr. Waldron, with Drs. Edward Schlesinger and Michelsen, is studying hydromyelia and its treatment by cord puncture.

Dr. Bruce Wiley, in association with Drs. Hilal and Wood and Dr. Duffy (Neuropathology), are starting an extensive program to investigate the angio-architecture of the central nervous system tumor. The work includes postmortem injections of brain specimens and the correlation of various

patterns of angio-architecture with cell types.

Dr. Wiley is continuing the investigation of potential correlation between degree of angiographic vascularity of meningiomas of the tuberculum sellae region and their demonstrability on radioisotope scan.

Dr. Harold Pachtman, in association with Dr. Wood and Dr. Hilal, studied the posterior choroidal arteries in patients and quantitated their displacement by various masses.

Dr. Pachtman, along with Drs. Wood, Hilal and Waldron, is carrying out an anatomic study of the anterior meningeal artery of the vertebral system and investigating its radiologic importance in pathologic states.

Nuclear Medicine

The utilization of nuclear medicine continues to increase as new techniques develop. The advent of polyphosphate (technetium ^{99m} tagged) for bone scanning has greatly facilitated the ease and availability of this diagnostic test.

Drs. Hilal, Cannon (Medicine), Brust (Neurology) and Johnson continued their investigation on regional cerebral blood flow quantitation using the Xe-133 washout method following intracarotid administration.

With Drs. Werner (Medicine) and Reilly, Dr. Johnson continued his investigation of the effect of iodine-125 on hyperthyroidism. Drs. Gersony (Pediatrics), Steeg (Medicine), Cannon (Medicine), Turino (Medicine) and Johnson undertook an investigation of intracardiac shunts using bolus injection of Tc-99m pertechnetate and quantitative data analysis in order to develop an improved technique for quantitating the magnitude of left-to-right shunts by a simple intravenous method.

Drs. Laragh (Medicine), Vaughan (Medicine) and Johnson undertook an investigation of dynamic renal imaging in patients with various types of hypertension. These data are correlated with hormone levels, results of renal arteriography and other data to establish the value of the procedure as a screening test in hypertension. Drs. Lawrence R. Muroff and Johnson continued an investigation of the vascularity of focal intrahepatic masses using In-113m and Se-75. The method holds promise of discriminating the various types of intrahepatic lesions.

In collaboration with the Riverside Research Institute, efforts to complete the Isoactivity Countour Plotter continued with a revised target date of Spring, 1973.

Radiation Research Laboratories

Dr. W. Gross and Mr. R. D. Colvett measured depth-dose distributions for 3.9 GeV nitrogen nuclei, and 5.7 GeV neon nuclei accelerated at the Princeton Particle Accelerator. Extensive dose measurements were made as part of the project to investigate the effect of these high energy heavy nuclei in biological systems.

The central effort of Drs. W. Gross, J. Dicello and R. Rodgers, and Mr. R. Dvorak has been to study the energy event distributions for a number of different radiation types. These include monoenergetic neutrons from the RARAF facility, neutrons from californium-252, heavy charged particles from the Yale HILAC, and for the first time, high energy heavy ions from the Princeton Particle Accelerator. For these measurements, special tissue equivalent wall-less counters have been designed and constructed.

A wide range of experiments in radiological physics and radiobiology has been conducted at the Radiological Research Accelerator Facility (RARAF), which is managed by Mr. L. Goodman. This joint enterprise between the Medical Department of Brookhaven National Laboratory and the Radiological Research Laboratory utilizes a five million volt Van de Graaff accelerator to produce charged particle beams (protons or deuterons) and monoenergetic neutrons.

Neutrons with energies from less than 100 keV to as high as 15 MeV have been employed. Experiments involving a wide range of biological test systems have been performed at the RARAF facility by scientists from Columbia and from Brookhaven.

Theoretical studies, based to a large extent on experimental data obtained in this laboratory, have been developed considerably during the year by Drs. H. H. Rossi and A. M. Kellerer. The Theory of Dual Radiation Action has been widely accepted.

Dr. Kellerer has developed a non-parametric method of analysis to elucidate how relative biological effectiveness (RBE) varies as a function of dose.

Dr. F. W. Gonzales has continued to study the radiation genetics of *Drosophila melanogaster*; mature sperm has been irradiated with x-rays and with 14 MeV neutrons. For the production of translocations and sex-linked recessive mutations, the neutrons are less effective than conventional x-rays; this is the only biological system known at present where mutations, neutrons are 1.1 times as effective as x-rays.

Dr. A. Underbrink has continued to observe somatic effects in *Tradescantia* induced by x-rays or neutrons.

Drs. E. J. Hall and S. Lehnert determined radiobiological properties of nitrogen nuclei accelerated to an energy of 3.9 GeV at the Princeton Particle Accelerator.

Experiments have been completed to investigate the effect of monoenergetic neutrons on the inhibition of growth of plant seedlings. A wide range of neutron energies was employed from 14 MeV down to 100 keV; the data obtained yield important clues about the basic nature of cell killing by ionized radiations.

Further studies have been completed with the man-made nuclide californium-252. This material emits a mixture of gamma rays and neutrons. Extensive laboratory investigations have been completed at this and other laboratories, as a result of which californium-252 is to be used in a limited number of carefully selected human cancer patients.

In experiments conducted by Dr. C. Borek, fresh explants of hamster embryo cells were cultured *in vitro* and exposed to graded doses of radiation; a small proportion of the cells undergoes a malignant transformation. The shape of the dose-response relationship for x-rays has been closely studied.

Francis Delafield Hospital Diagnostic Division

Dr. Kevin Macken and Dr. Arnold Bachman are conducting a roentgenpathologic correlation of breast lesions. Dr. Bachman is investigating the appearance of retrotracheal and retrobroncheal recesses as observed with lateral chest roentgenograms.

Radiotherapy Division

Dr. Ruth Guttman continues to study the effect of radiation on cancer of the breast, bladder, prostate and kidney.

Acknowledgements

The Department of Radiology gratefully acknowledges the research support from the United States Public Health Service, United States Atomic Energy Commission, National Cancer Institute, National Institute of Neurological Diseases, Hartford Foundation, Burlington Mills Foundation and the Ritter Foundation.

Statistics

The statistics for the year 1972 are attached and compared with 1969. No reliable statistics are available for 1970 and 1971. The data indicates a 5% overall increase since 1969 suggesting that the annual rate of increase has slowed down. For the

decade prior to 1969, the annual volume had been increasing about 6-8% per annum.

The Department has been operating close to the saturation point for a number of years and the increase, since 1969, is largely due to the increase in emergency examinations on nights and week-ends.

DIAGNOSTIC DIVISION

	1972	1969
Atchley/Harkness Pavilion	52,213	45,062
Babies Hospital	27,852	24,847
Presbyterian	120,069	119,637
Neurological Institute	28,162	29,549
Urology	6,576	7,780
Institute of Ophthalmology	1,763	193
Angiography	1,390	866
	238,025	227,934

1972

Thermograms	631
Ultrasound	5,436

NUCLEAR MEDICINE

<i>Scanning Procedures</i>	1972	1969
Liver	1,511	1,132
Thyroid	822	929
Lung	895	639
Bone	211	0
Kidney	119	
Spleen	135	
Other	1,014	
TOTAL	4,707	2,700

External Counting

RAI Uptake	1,198	1,597
Renogram	5	39
	1,203	1,636

In Vitro

T ₃ Resin Uptake	6,393	4,038
Schilling Test	88	171
Other	9	31

RADIOTHERAPY

<i>Radiotherapy</i>	1972	1969
Total New Patients	1,159	1,144
Total No. Treatments	23,632	22,904

1972 Publications

Radiology

Baker, D. H. and Berdon, W. E.

The use and safety of high dosage pediatric urography. *Radiology* Vol. 103, No. 2, May, 1972.

Bateman, J. L.; Rossi, H. H.; Kellerer, A. M.;

Robinson, C. V. and Bond, V. P.

Dose-dependence of fast neutron RBE for lens opacification in mice. *Rad. Res.* 51:381-390, 1972.

Berdon, W. E. and Baker, D. H.

Vascular anomalies and the infant lung: Rings, Slings and other Things. *Seminars in Roentgenology* Vol. 7, No. 1, January 1972.

Berdon, W. E.

Radiologic findings in the evaluation of the common autosomal disorders. *Develop. Med. & Child Neurol.* 14 (No. 2) 226-228, 1972.

Borek, Carmia

Neoplastic transformation in vitro of an isolated clone of liver cells under conditions of crowding and nutritional stress into differentiated hepatoma-like cells. *Proc. Nat. Acad. of Sciences* 69:956-959, 1972.

Brisman, Ronald; Hilal, Sadek K., and

Tenner, Michael

Doppler ultrasound measurements of superior sagittal sinus blood velocity. *J. Neurosurg.* 37:312, 1972.

Chow, C. K.; Hilal, S. K.; and Niebuhr, K. E.

X-ray image subtraction by digital means. *Life Sciences*, Computer Sciences from IBM Research, May 1972.

Colvett, R. D.; Rossi, H. H. and Krishnaswamy, V.

Dose distributions around a Californium-252 needle. *Phys. in Med. and Biol.* 17:356-364, 1972.

Crikelair, C. F.; Rein, J. M.; Potter, G. D. and

Cosman, B.

A critical look at the blowout fracture. *Plastic and Reconstructive Surgery* 49:374, 1972.

Dicello, J. F.; Gross, W. and Kraljevic, U.

Radiation quality of Californium-252. *Phys. in Med. and Biol.* 17:345-355, 1972.

Ellis, K.

Medical radiography and photography. *Resident's Corner*, 48:24-28, 1972.

Ellis, K.; Casarella, W. J.; Bowman, Jr., F. O.;

Hayes, C. J.; Gersony, W. M. and Malm, J. R.

Pulmonary atresia with intact ventricular septum — New developments in diagnosis and treatment. *Am. J. of Roentgenology, Radium Therapy and Nuclear Medicine*, 116: 1972.

Feldman, F. and Seaman, W. B.

Pulmonary gastric stump cancer. *Am. J. Roentgenol.* 115:257, 1972.

Freeman, L. M. and Johnson, P. M.

Renal imaging with radionuclides. Progress in Nuclear Medicine, Vol. 2: *Evaluation of Renal Function and Disease with Radionuclides*, Blafox MD, ed, Baltimore, University Park Press, 1972, pp 163-199.

- Gongaware, Robert D.; Rose, Judith S.; Berdon, Walter E. and Weil, Richard
Intrasplenic foreign body. The use of induced pneumoperitoneum for diagnosis. *Amer J. of Surg.* Vol. 124, No. 5, Nov. 1972.
- Groover, R. V.; Burke, E. C. and Berdon, W. E.
The genetic mucopolysaccharidoses. *Seminars in Hematology*, Vol. IX, No. 4, Oct. 1972.
- Gross, W. and Rodgers, R. C.
Heavy ion event spectra. *Proc. Third Symp. on Microdosimetry (Euratom)*, held Oct. 1971 in Stresa, Italy, 873-887, 1972.
- Hall, Eric J.
A comparison of radium and Californium-252 using cultured mammalian cells. *Radiology* 102:173-179, 1972.
The effect of hypoxia on the repair of sublethal radiation damage in cultured mammalian cells. *Rad. Res.* 49:405-415, 1972.
Radiation dose-rate; a factor of importance in radiobiology and radiotherapy. *Brit. J. Radiology* 45:81-97, 1972.
A determination of the OER for Californium 252 using cultured mammalian cells. *Brit. J. Radiology* 45:284-288, 1972.
- Hall, E. J.; Gross, W.; Dvorak, R. F.; Kellerer, A. M. and Rossi, H. H.
Survival curves and age response functions for Chinese hamster cells exposed to x-rays on high LET alpha particles. *Rad. Res.* 52:88-98, 1972.
- Harris, R. C. and Johnson, P. M.
Use of Anger camera in evaluation of excretion of ¹³¹I rose bengal from the liver (Abstract). *Pediatric Research* 6:377, 1972.
- Hilal, Sadek K. and Keim, Hugo A.
Selective spinal angiography in adolescent scoliosis. *Radiol.* 102:349, 1972.
- Hollander, B. A.; Hillal, S. K. and Seaman, W. B.
Evaluation of a radiographic imaging system with a microfocal spot x-ray tube. *Radiol.* 103:667, June 1972.
- Johnson, P. M.; Chao, S. and Reilly, J. A.
Placental imaging with ^{113m}IN. *Radiol.* 103:359, May, 1972.
- Karlan, M. S.; Basek, M. and Potter, G. D.
Intracochlear neurilemma. *Archives of Otolaryngology*, 96:573, 1972.
- Kellerer, A. M.
Microdosimetry and its alternatives. *Proc. Third Symp. on Microdosimetry (Euratom)*, held October 1971 in Stresa, Italy, 807-832, 1972.
- Kellerer, A. M.
An algorithm for LET-analysis. *Phys. in Med. and Biol.* 12:2, 1972.
- King, D. L.; Jaffe, C. C.; Schmidt, D. H. and Ellis, E.
Left ventricular volume determination by cross-sectional cardiac ultrasonography. *Radiol.* Vol. 104, No. 1: 201-202, July 1972.
- Potter, G. D.
Fractures of the temporal bone: Problems in radiologic diagnosis. *The Laryngoscope*, 82:408, 1972.
Tomography of the orbit. *Radiologic Clinics of North America*, 10:21, 1972.
- Renert, William; Berdon, Walter E.; Baker, David H. and Rose, Judith S.
Obstructive urologic malformations of the fetus and infant and their relation to neonatal pneumomediastinum and pneumothorax ("airblock") *Radiol.* 105:97-105, Oct. 1972.
- Rossi, H. H.
The role of microdosimetry in radiobiology and radiation protection. *Proc. Third Symp. on Microdosimetry (Euratom)*, held Oct. 1971 in Stresa, Italy, 1-29, 1972.
- Rossi, H. H. and Kellerer, A. M.
Radiation carcinogenesis at low doses. *Science* 175: 200-202, 1972.
- Rossi, H. H.
Neutron radiation quality. *Proc. Symp. on Neutron Dosimetry in Biology and Medicine. Euratom* 4896 d-f-e 1:57-71, 1972.
- Seaman, W. B.
Pulmonary gastric stump cancer. *Am. J. Roentgenol* 115:257, 1972.
- Simon, Gilbert and Berdon, Walter E.
Suprapubic bladder puncture for voiding cystourethrography. *J. of Ped.* Vol. 81, No. 3, 555-558, Sept. 1972.
- Sokal, M. S.; Koenigsberger, M. R.; Rose, J. S. and Berdon, W. E. and Santulli, T. V.
Neonatal hypermagnesemia and the meconium plug syndrome, *New Eng. J. Med.* 286:823-825, April, 1972.
- Sparrow, A. H.; Underbrink, A. G. and Rossi, H. H.
Mutations induced in tradescantia by small doses of x-rays and neutrons: Analysis of dose-response curves. *Science* 176:916-918, 1972.
- Srdoc, D. and Kellerer, A. M.
Event frequency in small cylinders exposed to x-rays. *Proc. Third Symp. on Microdosimetry (Euratom)*, held Oct. 1971 in Stresa, Italy, 497-510, 1972.
- Uson, Aurelio; Womack, Charles E. and Berdon, Walter E.
Giant ectopic ureter presenting as an abdominal mass in a newborn. *J. of Ped.* 80:3, March, 1972.
- Waldron, Robert L.; Seaman, William B. and Foster, S.
Reflux pancreatography and distension duodenography in humans. *Radiol.* 104:295, 1972.
- Weiss, M. B.; Schmidt, D. H.; Jaffe, C.; Casarella, W. Ellis, K. and Cannon, P. J.
Regional myocardial blood flow in patients with idiopathic myocardial hypertrophy. *Circulation* Suppl. II, II-235.

Rehabilitation Medicine

ROBERT C. DARLING

Baruch Professor and Chairman of the Department • Director of Service

This is a period of growing opportunities and responsibilities, unfortunately accompanied by a contraction of resources both of money and personnel. As a result we have been forced to devote our energy on a priority basis, postponing or abandoning some otherwise desirable opportunities.

Assistant Professor Paul Corcoran resigned to accept a position at Boston University. Dr. Naomi Turner joined the faculty as Associate. She brings experience in Rehabilitation Medicine from New Zealand and a prior period of fellowship training in this department. Dr. Derek Frewin, Lecturer in Human Physiology and Pharmacology at the University of Adelaide, Australia, is spending the current year as Visiting Lecturer in the department, primarily in research. Dr. Eugenio Alejano resigned from his academic position and his position at St. Luke's Hospital. Dr. Raul Sala was appointed Instructor, working at Roosevelt Hospital. Dr. Luke Chu resigned his clinical responsibilities at New York State Rehabilitation Hospital but continues research activities. Dr. Rudolfo Reyes, at the same hospital, assumed clinical direction of the Rehabilitation Medicine Department and was promoted to Assistant Clinical Professor. Miss Joy Cordery resigned her position of Research Associate.

In the Occupational Therapy Courses Miss Barbara Neuhaus was appointed Instructor and Mrs. Karen Diasio was promoted to Assistant Clinical Professor. Instructors Ruth Knippenberg, Hermine Plotnik and Phillip Petrolino resigned.

Dr. Charles E. Huckaba was recipient of the 1972 Stephen L. Tyler Award from the New York Sec-

tion of the American Institute of Chemical Engineers for his contributions to chemical engineering and biomedical engineering literature.

Through the use of SRS funds for medical student fellowships it was possible to offer summer experience for three medical students at the conclusion of their first year. Two of these from P & S, worked at P & S and Presbyterian Hospital, one from Tufts Medical School worked at Harlem Hospital. All three received a clinical indoctrination as well as an opportunity to utilize new techniques of patient monitoring and evaluation.

Dr. John A. Downey, in collaboration with Drs. Huckaba, Stanley J. Myers and Visiting Lecturer Frewin is expanding the work on human temperature regulation with increased emphasis on vascular responses to thermal stimulus and quantitative measurements of sweat production. In collaboration with Dr. Kenneth E. Eakins, Associate Professor of Ophthalmology, Drs. Downey and Frewin are studying prostoglandins and adrenergic responses to exercise and other stresses.

Dr. Myers is developing techniques of video tape recording of patient function with the aim of not only monitoring progress but also developing a library of teaching material. Dr. Myers with Dr. Robert E. Lovelace, (Neurology), is investigating further the effects of upper motor neuron lesions on the lower motor neuron.

Occupational Therapy Courses

The first year of the baccalaureate program was re-ordered to prepare the students better to meet

the growing demands of community-based, health-related programs. The students now devote a full year to normal human development, including the physical, psychological and social aspects of development. The second year of the program emphasizes treatment of pathological conditions, first psychosocial dysfunction and next physical dysfunction.

The graduate program incorporates a similar core interest through the first year but includes clinical pathologies and treatment earlier. This program includes three full terms in residence plus one term and two summers in field work, of which the final summer may be taken in a community health experience.

The Columbia Clinical Council of supervisors of clinical instruction has met three times during the year to confer in the improvement of clinical teaching and coordination of academic course work with clinical experiences.

A Training Grant from the Social and Rehabilitation Service was funded in the amount of \$35,594. Eight thousand of the above grant was given for a training project in Supervision and \$26,954 was allocated for student traineeships. Thirty of 53 students are dependent upon some form of financial aid.

The entering juniors and masters students of 1972 were selected from 81 applicants; of these 50 were accepted to fill 30 places. Twenty-six students registered to join twenty-eight second year students for a total of 54 in course. Twenty degrees were awarded in 1972, 11 B.S. and 9 M.S. Twenty-five graduates took and passed the Registration Examination conducted by the American Occupational Therapy Association.

Miss Marie Louise Franciscus serves as a member of the Committee on Basic Professional Education, American Occupational Therapy Association; member of the Executive Committee of the Committee on Basic Professional Education, AOTA; and Advisory Fellow, World Federation of Occupational Therapists.

Miss Karen Diasio presented a paper, "Occupational Therapy Consultation in an Urban Mental Health Day Center: A Model for Program Development," at the AOTA National Conference, Los Angeles. She is also Secretary of the American Occupational Therapy Association, Consultant and member of the Planning Advisory Committee to a research project of the School of Allied Medical Professions, College of Medicine, Ohio State University.

Miss Barbara Neuhaus serves as First Alternate

Delegate from the American Occupational Therapy Association to the World Federation of Occupational Therapists.

Miss Stephanie Presseller is a member of the Committee on Community Education, Metropolitan New York District, New York State Occupational Therapy Association. She was Guest Lecturer to the Long Island District of the New York State Occupational Therapy Association and to the Bronx Veterans Administration Hospital, Occupational Therapy Department.

Courses in Physical Therapy

Miss Bernadette Hecox, with an extensive background of experience in dance and physical therapy, is involved with the exploration of the use of some aspects of dance in relation to physical rehabilitation of patients, in collaboration with two additional physical therapists, a graduate anthropologist, and Dr. Shy-Jong Yue, Associate Clinical Professor of Rehabilitation Medicine at St. Luke's Hospital.

Miss Althea Jones participated as a lecturer and demonstrator at a program for the New Jersey Chapter of the American Physical Therapists Association entitled "Underlying Principles of the Neuropsychological Approach to Treating the Hemiplegic Patient"; and at a workshop for the Department of Occupational Therapy at Jacobi Hospital.

Miss Ruth Dickinson attended an institute at the University of North Carolina entitled "Legal Aspects of Arranging Clinical Education for Physical Therapy Students".

A grant has been received from the Division of Allied Health Manpower (HEW) for a project entitled "Designing Clinical Experiences to Meet the Objectives of Physical Therapy Education". Professor Dickinson is the Project Director for this activity.

Misses Mary Callahan and Dickinson continue to serve as team leaders on Curriculum Survey visits for the accreditation of educational programs in Physical Therapy. This is a joint venture with the Council on Medical Education of the American Medical Association.

Miss Callahan continues to serve as a "regional consultant" to the Social and Rehabilitation Service Educational Grants program of HEW, and to the "Panel on Stroke" of the New York Metropolitan Regional Medical Program. She was appointed a member of the Advisory Committee to a "Programmatic Research Project on the Rehabilitation of the Home-bound" which is being developed by the Federation of the Handicapped.

A prerequisite course in basic first aid is now an

entrance requirement. An interdisciplinary course at Teachers College entitled, "Applied Physiology", has been included in the curriculum. Progress is being made toward the ultimate goal that all students of physical therapy will have a block of field experience in community comprehensive health care facilities.

Government traineeships, although limited in number, continue to be the main source of scholarship assistance. Small scholarships are received from private foundations, clubs and religious organizations. The availability of huge numbers of well qualified applicants has enabled the Committee on Admission to select very well qualified and outstanding students for study in Physical Therapy.

New York State Rehabilitation and Research Hospital, West Haverstraw

Plans are well on their way with planning groups and with architects for the building of a new major hospital building on the present site. The official name of the hospital at present is New York State Rehabilitation and Research Hospital.

An exhibit, "The Techniques of Modular Unit Prosthetic Program for Lower Extremity Amputees: A Team Approach" was presented at the American Congress of Rehabilitation Medicine annual meeting in Denver, Colorado by Drs. Rudolfo Reyes, Alice Garrett, Director, New York State Rehabilitation and Research Hospital, and Edward B. Leahey, Assistant Clinical Professor of Orthopedic Surgery.

Harlem Hospital

Weekly teaching sessions with medical students assigned to the Department of Neurology at the Center have become a regular activity of the physician-in-charge of the In-Patient Unit.

Dr. Roy Brown participated in the development of the exhibit of the Harlem Regional Stroke Program at the annual meeting of the American College of Physicians, in April.

Dr. Herbert L. Thornhill was elected representa-

tive of the Harlem Center to the Faculty Council of the College of Physicians and Surgeons.

A presentation, "Race and Poverty As Factors in the Pathogenesis of Motor Disability" was made to the New York Society of Physical Medicine and Rehabilitation in February by Drs. Albert D. Anderson, Thornhill, Claire Schiller and Lucille Gunning.

Dr. Thornhill and Miss Martha L. Williams, presented a paper "Experience with the Water Mattress in a Large City Hospital" at a Seminar on Pressure Sores at a meeting of the New York Chapter, American Physical Therapy Association.

A paper "Neuropathic Arthropathy in Chronic Alcoholism" by Drs. Thornhill, Ralph Richter (Neurology), Maurice Shelton (Orthopedic Surgery) and Christopher Johnson (Radiology, Harlem Hospital) was presented by Dr. Shelton at the meeting of the Orthopedic Foot Society in Washington, D. C.

A paper entitled "The Addict on the Rehabilitation Ward", co-authored by Drs. Schiller and Richter, was presented at a breakfast meeting at the Academy of Physical Medicine and Rehabilitation in Denver in August.

The SRS grant to train and use para-professionals to perform certain tasks once considered the exclusive domain of rehabilitation professionals enabled the department to establish "The Patient Function Evaluator Training Program."

A professional Nurse Traineeship Program "Effecting Realistic Discharge of Minority Groups into the Ghetto" was made possible by a NIH grant.

"Positively Black", a WNBC television program concerned with the problems and experiences of the Black community in New York, devoted three segments of the spring program to Rehabilitation Medicine at Harlem Hospital Center. The films described the Harlem community from the viewpoint of the disabled and described the occupational therapy and physical therapy sections of the department in some depth. A copy of the film is now being used for teaching and recruitment.

1972 Publications

Rehabilitation Medicine

- Cocchiarella, A.; Challenor, Y. and Katz, J. F.
Orthosis for use in Legg-Calve-Perthes' disease.
Arch. Phys. Med. & Rehabil. 53:286-288, 1972.
- Cunningham, D. J.; Downey, J. A. and Huckaba, C. E.
Behavioral thermoregulatory responses following changes in core temperature, without parallel displacement in peripheral sensory input. *Int. J. Biometeor.* 16:43-44, 1972.
- Downey, J. A.; Huckaba, C. E. and Darling, R. C.
The effect of skin and central cooling on human thermoregulation. *Int. J. Biometeor.* 15:171-175, 1971.
- Downey, John A.; Frewin, Derek B. and Whelan, R. F.
Vascular responses in the hands of patients suffering from Migraine. *J. Neurol., Neurosurg., & Psych.* 35: 258, 1972.
- Gonzalez, Erwin G. and Downey, John A.
Polyneuropathy in a glue sniffer. *Arch. Phys. Med. & Rehabil.* 53:333-337 1972.
- Huckaba, Charles E.; Downey, John A.; Darling, R. C. and Hansen, Lynn W.
The calculation of temperature distribution in the human body. *Fed. Proc.* 31:339 Abs., 1972.
- Huckaba, C. E.; Downey, J. A. and Darling, R. C.
A feedback-feedforward mechanism describing the interaction of central and peripheral signals in human thermoregulation. *Int. J. Biometeor.* 15:141-145, 1971.
- Huckaba, Charles E.; Downey, John A.; Darling, Robert C. and Hansen, Lynn W.
Constraints in the simulation of physiological systems. Proceedings of the 25th Annual Conference on Engineering in Medicine and Biology, Bal Harbour, Fla., Oct. 1972.
- Schiller, C.
Chronic disease and disability. In: *Dentistry for the Special Patient: The Aged, Chronically Ill and Handicapped*. Davidoff, Winker & Lee, eds. Philadelphia, Saunders, 1972.

Surgery

KEITH REEMTSMA

Professor and Chairman of the Department • Director of Service

This year was one of increasing activity in the clinical, research and teaching functions of the Department of Surgery and the Surgical Service.

The Intensive Care Unit was opened in the 14 East area and provides the most modern environment for critically ill patients. The number of injured patients cared for on our service continues to increase rapidly.

A dialysis and transplantation program is under development at Presbyterian Hospital.

This report refers to these changes and includes reference to our other clinical, research and teaching efforts.

Teaching

The Teaching Committee of the department, under the chairmanship of Dr. Philip D. Wiedel, has been responsible for the organization of undergraduate and graduate educational programs.

Undergraduate

Dr. Alfred Jaretzki III, has continued to coordinate the departmental contributions to the teaching of anatomy in the first year. He has organized a series of Correlation Clinics in which members of the department and of the Departments of Orthopedics and Urology have presented illustrative clinical cases in coordination with the laboratory dissections. In addition, members of the department have participated in the teaching in the dissecting rooms on a regularly scheduled basis.

In the third semester, Dr. Edward B. Self has

organized the department's participation in the teaching of history taking and physical examination in the Introduction to the Patient course. This teaching has been done at Presbyterian, Delafield, Harlem, Roosevelt and St. Luke's Hospitals. An introductory course dealing with local and systemic responses to injury and the processes of repair has been directed by Dr. Wiedel.

The teaching in the major clinical year has continued to be coordinated by Dr. Robert G. Bertsch. With the reorganization of the clinical services from two into three sections, the students have been assigned as active members of each team. Since these are responsible for the care of all patients, ward, semi-private and private, the students have taken a greatly increased part in the care of the latter two categories and it is felt that the clerkship has improved considerably as a result. A concomitant result has been a decrease in the number of students in each group and a 50% increase in preceptor assignments.

Dr. Frank E. Gump has been responsible for the elective program. Surgical sub-internships at Presbyterian and affiliated hospitals have continued to be chosen extensively by the students. In addition, a number have been permitted to select sub-internships at other university hospitals. A course in surgical anatomy and technique was organized and directed by Dr. Shivaji B. Bhonslay and given for the first time in April, with the assistance of the Department of Anatomy. The course was fully subscribed and met with an enthusiastic reception

by the students. The department also joined the Department of Medicine in the organization of a new elective course in gastroenterology. Our contribution to the course was coordinated by Dr. Alfred M. Markowitz. A number of students also spent elective periods in the research laboratories of members of the department and in the Division of Surgical Pathology.

Graduate

The house staff teaching program, organized by the House Staff Committee, under the chairmanship of Dr. Richard Weil, III, is accomplished by many different teaching techniques, including postgraduate courses, lectures, conferences, research seminars, and unscheduled clinical teaching sessions. Each year the program graduates five residents who are eligible for the American Board of Surgery. In addition, postgraduate clinical training programs are offered in pediatric surgery, plastic surgery, thoracic-cardiovascular surgery, and nonthoracic-vascular surgery. A fellowship in surgical gastroenterology will be offered for the first time in 1973. The Surgical Scientist Program, sponsored by the National Institutes of Health, is available to four qualified residents who wish to make a serious commitment to laboratory investigation.

The structure of the surgical training program is currently being re-evaluated from the standpoint of training objectives and funding mechanisms. The future of the internship and the possibility of a core-training program for all surgical specialties are issues which remain unresolved at the present time.

A three-day postgraduate course in vascular surgery was given in March under the direction of Drs. Arthur B. Voorhees, Jr. and Ferdinand F. McAllister. This was very well received, with approximately 125 doctors subscribing and numerous residents and medical students attending.

Research

Surgical Metabolism

The surgical metabolism program, under the direction of Dr. John M. Kinney, has made progress in several areas, particularly carbohydrate metabolism, heat transport and ventilatory patterns following injury.

Glucose intolerance following operation or injury has become of increasing importance with the advent of intravenous alimentation since this technique relies on glucose as the primary source of calories. Hepatic vein catheterization studies, designed to clarify the mechanisms of glucose intolerance, have been carried out by Dr. Frank Gump and Dr. Calvin

Long. The liver plays an important role in glucose intolerance and continued hepatic glucose production appears to be more important than abnormal peripheral utilization of this substrate. Splanchnic insulin output was found to be increased, suggesting the presence of insulin resistance in critically ill patients. Intravenous hyperalimentation has been studied in an effort to define the optimum rate of administration, calorie to nitrogen ratio and composition of individual amino acids. Amino acid profiles in patients undergoing hyperalimentation suggest that certain essential amino acids are present in limiting amounts and it will be necessary to re-define amino acid requirements in injured patients as opposed to normal subjects.

The mortality from major sepsis continues to be high and is often related to stress affecting the cardiorespiratory system. A number of factors contribute to the hyperdynamic state often associated with sepsis but the circulatory requirements for heat transport have received little attention. For this reason normal subjects have been studied in the Surgical Metabolism Unit by Dr. Elliott Badder in a room specifically designed for partitioned calorimetry. This makes it possible to determine the circulatory response to an increased heat load by measuring the increase in cardiac output, while the routes of heat loss are determined by calorimetry. At the same time, the hyperdynamic state is under study in septic patients by Dr. Richard Gusberg and Dr. Peter Scholz. Preliminary studies suggest that the non-nutritional segment of the increased blood flow in these patients is due to abnormal rigidity of the red blood cells rather than anatomic shunts as has commonly been assumed in the past.

The influence of injury and sepsis on pulmonary function continues to be a major area of research interest. The canopy-computer system for continuous spirometry and measurement of gas exchange has been further refined by Dr. Jordan Spencer and Mr. John Broell and clinical studies have been carried out with Dr. Bashir Zikria. Normal ventilation is altered following abdominal operations and a more restrictive pattern is evident on computer analysis. Such a pattern features a decreased and fixed tidal volume rather than the normal fluctuations thought to be important in maintaining proper alveolar expansion. Recently Dr. Denis Halmagyi, Visiting Professor from Sydney, Australia, has been participating in this work.

Cardiovascular and Pulmonary Surgery

Dr. Malm, Director of the Chest Surgical Service and associates, Drs. Bowman, Beach and Edie, have

collaborated with the Departments of Pharmacology (Drs. Brian F. Hoffman and J. Coopersmith), Anesthesiology (Drs. Stuart E. Sullivan and Richard W. Patterson), Psychiatry (Dr. Donald Kornfeld and Dr. Stanley Heller) and Pediatrics (Dr. Welton Gersony, Dr. Constance Hayes and Dr. Ehud Krongrad) in a group of inter-related clinical and basic research programs of the heart and lungs.

Drs. Hoffman and Malm are co-investigators, with Dr. Bigger and Wang, of a program project grant from the National Institutes of Health to develop basic techniques in electrophysiology and pharmacology into improved patient management. These include precise methods for identification of specialized intra-cardiac conduction pathways, cardiac pacing techniques to control cardiac arrhythmias and improved methods of computerized on-time measurements of causes of postoperative aberrant conduction (Drs. Krongrad and Coopersmith). Direct myocardial cell measurements are being made of abnormal human cardiac muscle to measure change in trans-membrane action potential by Dr. Bush. Dr. Spotnitz, continuing his interest in myocardial performance and rectus muscle structure, has investigated the use of skeletal muscle as a supplemental power source for circulatory support. Dr. Bregman has initiated a clinical and research program for circulatory support with the intra-aortic balloon pump. Dr. Beach has been investigating the optimal pharmacologic regimen to be used with balloon circulatory assist. Dr. Merker has completed a study of the pressure flow patterns of human coronary arteries following saphenous vein bypass graft with Dr. Reemtsma, and Dr. Parodi investigated the structural characteristics of human veins to identify the optimal sources of grafts for bypass procedures.

Dr. Sullivan continues the study of the oxygen cost of breathing following cardiac surgery with the establishment of a complete computerized record system within the cardiac research unit. Drs. Kornfeld and Heller have completed a prospective study on a psychometric evaluation of patients undergoing heart surgery, showing improvement in test performance six months following correction.

Drs. Gersony and Hayes continue a collaborative program in the management of the infant requiring cardiac surgery within the first six months of life.

Cancer and Cell Physiology

Dr. Paul LoGerfo, working in the laboratory of Dr. Frederic P. Herter at Delafield Hospital in conjunction with Dr. Sydney Bennett, Dr. Virginia Livolsi and Mr. Darrow Haagensen, has developed

a radioimmunoassay to detect tumor associated antigen (TAA) in the sera of patients. Over 4,500 sera have been assayed to date and elevated plasma antigen levels have been found in a wide variety of neoplasms and some non-neoplastic inflammatory diseases. A correlation is noted between the stage of the neoplasm and the level of antigen. Serial antigen determinations in patients undergoing curative operations for cancer have revealed prognostically significant antigen disappearance patterns after surgery. TAA has been found to be distinct (though clearly related) to the carcino-embryonic antigen (CEA) of Gold. It is found in low concentrations in some normal tissues and is thus not tumor specific; it is present in both entodermal and non-entodermally derived tissues. Antibodies to the antigen cannot be demonstrated. In addition to the studies on TAA, radio-immunoassays have been developed for plasma lactoferrin, blood group A substance and lactoalbumin. Innunoperoxidase and immunofluorescent staining techniques are being used to localize lactoferrin, lactoalbumin, TAA and thyrocalcitonin in human tissues. Using these as markers it is hoped that the cells of origin of several types of human carcinoma may be determined.

Dr. Duncan L. McCollester, also working in the Surgical Research Laboratories at Delafield, has continued his studies of the antigenic activity of isolated tumor cell membranes. By immunizing with isolated homologous cell surface membranes about a 20% rejection rate has been achieved for established transplanted Meth A sarcoma in Balb/c mice and spontaneous breast carcinoma in Paris R III mice. For the first time it appears possible to immunize AKR/J mice against the development of spontaneous leukemia. These results reflect various modifications in the membrane isolation procedure.

Dr. Nicole Suci-Foca, pursuing her studies of impaired cell-mediated immunity in cancer patients, has observed that "factors" in the sera of patients with cancer inhibit DNA synthesis in lymphocyte cultures stimulated by histo-incompatible HL-A antigens; in the presence of serum from healthy volunteers lymphocytes from cancer patients usually display a normal MLC (mixed lymphocyte culture) response. This suggests that impaired lymphocyte response in cancer is not due to a primary lymphocyte defect but rather to the blocking effect of serum "factors." Efforts are being made in collaboration with Dr. LoGerfo to isolate and characterize those blocking "factors."

Dr. David B. Habif, in association with Drs. Andrew G. Frantz and George A. Hyman, is study-

ing the response of patients with advanced mammary carcinoma to L-dopa suppression of serum prolactin levels. Rather marked subjective and objective improvement was noted in the majority of 20 patients treated. Dr. Sven J. Kister and Dr. Cushman D. Haagensen continue their analysis of "high risk" groups in breast carcinoma; with Dr. Robert DeBellis, Dr. Sven J. Kister has established clinical protocol for the study of various hormonal and chemotherapeutic regimens in the treatment of advanced breast cancer. Dr. Sven J. Kister is also collaborating with Dr. William Dilley (Anatomy) in organ culture studies of breast tissue. Dr. Alfred Jeretzki, III and Dr. Robert DeBellis are currently establishing chemotherapy protocols for the treatment of advanced lung cancer. Dr. Charles A. Slanetz, Jr. and Dr. Frederic P. Herter are continuing their comprehensive analysis of over 5,000 patients treated for colo-rectal cancer at the Medical Center. Dr. David M. C. Ju has completed a study on the etiology of lip cancer, implicating prolonged skin exposure as the precise causative factor. Dr. George F. Crikelair is investigating the significance of perimeural spread in keratoacanthoma. Dr. Thomas V. Santulli continues to direct the Pediatric Combined Tumor Clinic and is amassing further data on neoplasms in the pediatric age group.

In the F. Higginson Cabot Laboratory of the Division of Surgical Pathology, Drs. Gordon Kaye, Nathan Lane and Cecilia Fenoglio, have continued their studies on the comparative morphologic and functional aspects of normal and abnormal colonic mucosa and on the probable precancerous role of adenomatous mucosa. Dr. Fenoglio has demonstrated the absence of lymphatics in normal, hyperplastic and adenomatous colonic mucosa and has related this observation to the rarity of metastases from small carcinomas in pedunculated adenomas. With Dr. Robert Pascal, this same group has described the comparative ultrastructure of normal, hyperplastic and adenomatous colonic epithelium, using correlated transmission and scanning microscopic techniques. Dr. Gordon Kaye, Dr. Raffaele Lattes and Dr. Yao-Shi Fu are collaborating with workers at the University of Geneva in correlated light and electron microscopic studies of soft tissue tumors. Dr. Marianne Wolff is pursuing studies of various tumor entities, including lymphangiomyoma, primary epithelial neoplasms of the appendix, retrorectal cysts, bile duct cystadenomas, hamartomas of the lung, and steroid-treated regional enteritis. Dr. Karl H. Perzin, also from Surgical Pathology, has completed clinical-pathological studies of lymphosarcoma of the small intestine, papillary

adenoma of the nipple, papillomatosis of the nasal cavity and granular cell tumors of the biliary tract. A number of other pathological investigations are underway, not only by Dr. Perzin, but by Dr. Virginia V. Livolsi, Dr. Joel Roth, Dr. Cecilia Fenoglio, Mr. Daniel Von Hoff and Dr. Michael Koss.

Wound Healing

Dr. John F. Prudden's work on the acceleration of tissue healing has expanded in both the laboratory and clinic during the past year. Standard creams have been made of polymeric N-acetyl glucosamine (POLY-NAG) which have been used with striking effect in the clinical treatment of non-healing wounds; and the collaboration with the Oral Surgery Department of the Dental School in the treatment of dry sockets with processed cartilage continues. Immediate relief of this distressing problem is uniformly obtained.

In addition, sutures have been made of POLY-NAG which demonstrate an ability to increase the strength of experimental wounds up to 70% greater than wounds closed with silk, catgut, or plastic monofilaments.

Finally, it has been demonstrated that highly processed cartilage from a wide variety of animal sources acts as a non-specific antigen when injected subcutaneously in animals or in humans. This work was done in conjunction with Dr. Suciu-Foca of Dr. Joseph Buda's Delafield Immunology Laboratory. This appears to result in blocking of many specific antibodies, and in the enhancement of cellular immunity without influence on humoral immunity. The implications of these observations are exciting, and will be the subject of intensive investigations during the coming year.

Hepatic Regeneration

Dr. Price and his associates have shown that animals maintained without splanchnic portal organs developed specific hepatic lesions correctable by the presence of the GI tract with the pancreas, exogenous pancreatic glucagon or partial correction by the non-pancreatic GI tract. By use of partial hepatectomy in the groups of dogs, it has now been demonstrated that glucagon is a portal factor modifying hepatic regeneration. Hepatic hyperplasia as monitored by DNA synthesis rates took place at an increased rate in the absence of glucagon. Current data suggests that hepatic hypertrophy is strongly influenced by glucagon determined levels of cyclic AMP, while hepatic hyperplasia is initiated by factors that do not arise in the portal organs but probably from the liver itself.

Transplantation

The Columbia transplantation programs continue to develop at Presbyterian Hospital, Babies Hospital, Delafield Hospital, St. Luke's Hospital, and Mary Imogene Bassett Hospital. Harlem Hospital and Roosevelt Hospital have supported the efforts of the other Columbia institutions.

A four-bed dialysis unit has been established at Presbyterian Hospital, under the directions of Drs. John Laragh and Genette Jacob. This unit will provide a capability for adult and pediatric dialysis, and will allow the clinical transplant program to move forward at Presbyterian and Babies Hospitals. This unit will in time be superseded by a permanent Dialysis and Transplantation Center to be constructed on PH-4 Center, with occupancy projected for 1975. Drs. Reemtsma and Weil are working with other investigators from the Departments of Surgery, Pathology, and Pediatrics on the transplantation of the endocrine pancreas and on the development of better immunosuppressants.

Drs. Buda, Lattes, and Price, in collaboration with members of the Departments of Medicine, Urology, and Pathology, are enlarging the clinical kidney transplantation program at Delafield Hospital. Dr. Nicole Suciu-Foca and Dr. Joseph Buda have developed an outstanding laboratory in clinical immunology, with emphasis on newer methods of assaying histocompatibility, particularly the blast cell count and mixed lymphocyte culture. This laboratory provides the clinical tissue typing data for the entire Columbia transplantation program.

Drs. Stevens, McCabe, and Lattes have begun doing kidney transplantations at St. Luke's Hospital, with the collaboration of Dr. David David of the Department of Medicine (Nephrology). Dr. Stevens is preparing an antilymphocyte globulin which will be utilized to try to determine its effectiveness in human kidney transplantation. Dr. McCabe continues to harvest cadaver kidneys through the Metropolitan area, and he preserves them in his laboratory using the Belzer machine. Drs. Stevens and McCabe are coordinating the cadaver organ procurement and preservation work for the Columbia program.

Dr. David Blumenstock and his colleagues at Mary Imogene Bassett Hospital continue their investigative work in transplananation biology. Dr. Ferree's beagle colony, with known DL-A types, has been invaluable to many other investigators, including Professor Jean Dausset of Paris and Dr. Marshall Orloff of San Diego.

The Columbia transplantation program is being

developed at these several hospitals in an effort to maximize the capabilities of the program and to minimize duplications of effort. This unified approach will provide the most efficient possible framework for the development of significant clinical and investigative data.

Plastic Surgery

Dr. George F. Crikelair continues his work on fabric flammability. He is a member of the Advisory Committee to the Secretary of Commerce dealing with flame retardant clothing. Dr. Francis C. Symonds is doing a temperature study of flame burns, and the entire plastic section in conjunction with Dr. Charles Fox, Jr., is evaluating the efficacy of 1% silver sulfadiazine for the local antibacterial treatment of burned surfaces, in contrast to sulfa-mylon.

Dr. Bard Cosman has completed clinical studies on scars, keloids and acne keloidalis and is presently evaluating, with Dr. Marianne Wolff (Surgical Pathology) criteria for completeness of keloid excision. With Drs. Joel Rein and George Crikelair, Dr. Bard Cosman is carrying out a clinical and x-ray analysis of trimolar fractures. Dr. Symonds has completed a review of hand and forearm injuries and is now analyzing the results of tendon transfers for ulnar nerve palsy.

The work on perineural involvement by keratoacanthomas is continuing as is investigative work on agenesis of the anterior abdominal wall and laboratory experimentation dealing with transplantation of the submandibular gland.

Patient Care

Several crises have occurred and continue to re-occur in the area of patient care on the surgical service of the Presbyterian Hospital. The number of major and minor trauma cases continues to increase at an alarming rate. The injuries are often severe, and multiple gun shot and stab wounds have become routine problems for the surgical service. When large numbers of such patients are admitted during a short period of time it represents an extremely difficult burden for the resident and attending staff. The resident staff has responded many times to coming in on off duty hours when serious emergencies are presented to the service. These cases also impose an additional burden on the attending staff who often assist at such surgical procedures because of their complexity and seriousness. Another problem of growing concern is the lack of sufficient supervisory personnel in surgery during the peak evening hours of Vanderbilt Clinic. With

the continuing decrease in available number of outside physicians, the emergency room load for minor surgery continues to increase and represents an unsolved problem to the surgical service.

The surgical follow-up and after care clinics, now coordinated into the team system, has improved patient care with availability of attending surgeon consultations and the decreased waiting time necessary for expert opinion.

The semiprivate service continues to supply large numbers of patients for resident surgical experience. It also has had a salutary effect in providing private surgical care for more individuals than has been present at the Medical Center heretofore. The problems in the physical plant, small number of laboratories and lack of conference area continue and need urgent solution.

The organization of Harkness Pavilion to admit the great majority of surgical patients to the 4th and 6th floors has resulted in better patient care in terms of both its nursing and surgical coverage. With the advent of the new team system, private patients have been increasingly used for resident and medical student education. With better resident coverage of private cases, surgical care in Harkness has improved significantly.

The Surgical Intensive Care Unit opened for patients during the fall of 1972 under the direction of Dr. John M. Kinney. Patient care is given by the staffs of both Departments of Surgery and Anesthesiology. The physical facilities of the Surgical Intensive Care Unit are excellent, with all modern monitoring devices available. The monitoring of critically ill patients and high levels of nursing care have improved patient care considerably.

The new emergency area in Vanderbilt Clinic is still in the building stage, but plans have been reviewed to make maximal use of the space available to the Department of Surgery for care of emergency and critically ill patients. The new facilities will undoubtedly be a marked improvement over the small, cramped quarters in which surgery now works in Vanderbilt Clinic.

Affiliations

Affiliation agreements have been made between Columbia University and the following hospitals: St. Luke's, Roosevelt, Delafield, Harlem and Mary Imogene Bassett. Faculty on the Surgical Services of these hospitals participate in the overall planning and operation of the research and teaching functions of the department.

Contributions

We wish to acknowledge with gratitude contributions to surgical research from the following: Peter D. Lowitt, Mrs. J. Streicher, Mary Beth Hall, The Montargent Foundation, Inc., Mr. and Mrs. Benjamin H. Skor, Mr. and Mrs. William D. Cox, Miss R. S. Reichert, Mr. and Mrs. Antonios Vamvouris, Lincoln Rochester Trust Co., Frances Allen Foundation, Mrs. Anne B. Middendorf, Mrs. Frieda C. Keesler, Alyse Snyder Memorial Fund, Mr. Burton Gwitzman, Mr. George W. Wyckoff, TRW Employees Charity Organization, Metzger-Price Fund Inc., Miriam and Milton Petrie Foundation, Mrs. Christian A. Herter, Mrs. Harriet Ackley, Mrs. Bernard Stern, Mr. William M. Bristol, III., Mrs. Liana Zeri, Dr. Thomas V. Santulli, Mrs. C. DiOrio, Mrs. Carl Lang, Mrs. Henry

PRESBYTERIAN HOSPITAL

	<u>1970</u>		<u>1971</u>		<u>1972</u> Jan. to Oct. 31, 1972 (incl. SUS)	
	<i>Priv.</i>	<i>Ward</i>	<i>Priv.</i>	<i>Ward</i>	<i>Priv.</i>	<i>Ward</i>
OPERATIONS						
Heart-Chest, Incl. Babies H.....	494	265	630	253	532	199
Plastic	457	430	388	432	360	339
Gastrointestinal	386	256	386	165	341	189
Gall Bladder-Pancreas	219	187	292	142	253	143
Appendectomy	53	82	52	70	28	90
Rectal	225	62	274	129	192	33
Breast	509	191	432	125	469	116
Hernia	386	183	521	168	350	101
Other Abdominal	175	151	181	120	142	150
Miscellaneous, Incl. Vascular	406	174	325	109	370	87
Pediatrics	353	318	281	238	336	252
Head-Neck	104	31	197	58	77	18
Thyroid	159	51	242	83	161	27
	<u>3,926</u>	<u>2,381</u>	<u>4,201</u>	<u>2,092</u>	<u>3,611</u>	<u>1,744</u>
TOTAL		6,307		6,293		5,355

H. Muller, Mrs. Crystal Lang, Mrs. Bettina Looram, Baron Leopold de Rothschild, Mrs. Willeta Miller, Mrs. Evelyn Jaffe, William Casper Graustein Memorial Fund, Samuel Lemberg, Joseph M. Schoenberg, Mrs. Molly K. Rockwell, Mr. and Mrs. Frederic A. Bourke, Jr., Dr. and Mrs. Harold Berson, Consolidated Refining Corporation, Mr. and Mrs. Julius Eisen, Mr. and Mrs. Bruce Farkas, Mr. J. Robert Fisher, Walter and Joseph Ford Foundation, Mr. Lee Gorgens, Mr. Eugene Goldstein, Mr. and Mrs. Abram Gross, Mr. George H. Haley, Mr. and Mrs. E. F. Heft, Dr. and Mrs. Leo Igel, Mr. and Mrs. I. Levine, Mr. and Mrs. Burton Lichten, Mr. and Mrs. William Marr, Mrs. Donald Mason, Mr. Walter Matter, Mrs. Elsa Mauthner, The Ambrose Monell Foundation, Dr. Marian Irwin Osterhout, Mr. and Mrs. Joseph Pearlman, Mrs. Margaret Perry, Dr. Ira Rashkoff, Readers Digest Corporation, Mr. Michael H. Rosen, Mr. Robert Rosenberg, Mr. George M. Saks, Dr. and Mrs. Edward B. Self, Mr. Allan Shelden, III., Mr. Stephen Sicherman, Mrs. Margaret Stiassni, Tisch Family Foundation, Mr. Elliott Van Vleck, The G. Unger Vetlesen Foundation, Mrs. Alice Warfield, Mrs. Regina Weisman, Mr. and Mrs. L. Werner, Mrs. Dorothy Wolf, Mr. and Mrs. Martin Wolf, Mr. Seymour Milstein, Mr. P. Milstein, Mr. Henry Bemach, Stella and Charles

Guttman Foundation, Inc., Mr. Robert Roskind, Mrs. N. Comis, Mrs. Fred Uhl, Dr. P. J. Puchner, Mr. and Mrs. David Lanzet, Dr. James Malm, Dr. James C. Joyner, State Kidney Disease Institute, Kidney Foundation, Rudin Foundation, Lindsley Foundation, The Brook Foundation, Inc., Maxwell Leeds Pediatric Tumor Foundation, Inc., Crane Fund For Widows and Children, Park and Davis, G. D. Searle and Co., Auerback & Buck, Mr. and Mrs. Abba Bayer, Bergreen & Bergreen, Mrs. Irmi A. Bering, Mrs. Doris Berk, Mr. and Mrs. Richard H. Casey, Chase Manhattan Bank (Mr. F. J. Figge, Vice-President), Chemical Bank (R. J. May, Senior Vice-President), Mr. I. N. Clarenon, Dai Foundation, Estate of Mr. Samuel F. Dixon, Mr. and Mrs. Arthur Z. Eisen, Mr. Cyrus Fisher, Mrs. Eve Goldstein, Mr. and Mrs. A. J. Frankel, Mr. George H. Hutzler, Jr., Herzfel & Stern, Mr. and Mrs. S. Hinerfeld, Mr. and Mrs. R. Kaufman, Mr. and Mrs. J. Knapp, Mrs. M. Leon, Mrs. Gertrude Maged, Michaels Philanthropic Foundation, Nice-Pak Products, Inc., Miss Daisy PandeLeon, Mr. and Mrs. Robert M. Sayers, Mrs. Louise D. Schickhaus, Mrs. Marion Seal, Dr. Morris Siegel, Dr. Maximilian Silbermann, Mr. and Mrs. W. Stevens, Stephen H. Weiss Foundation, The Weissman Charitable & Education Fund, Inc., Mrs. E. J. Whitfield, Arthur Young & Company.

1972 Publications

Surgery

Beach, P. M. and Malm, J. R.
Homologous aortic valve replacement. In: *Biological Tissue in Heart Valve Replacement*. Ionescu, M. I., Ross, D. N., and Wooler, G. H. eds., Butterworth & Co., London, 1972.

Beach, P. M.; Bowman, F. O., Jr.; Kaiser, G. A.; Parodi, E. and Malm, J. R.
Aortic valve replacement using frozen irradiated homograft—Long term evaluation. *Circ. (Suppl. I)* 45:I-29 -I-35, 1972.

Aortic valve replacement with frozen irradiated homografts: Long term evaluation. *Cardiovas. Surg.* 1971, Monograph No. 35, pp. I-29 -I-35, 1972.

Bruck, H. M.; Nash, G.; Foley, F. D.; Stein, J. M. and Lindberg, R. B.
Studies on the occurrence and significance of fungi in the burn wound. *Ann. Surg.* 176:108-110, 1972.

Bruck, H. M. and Pruitt, B. A.
Curling ulcer in children: a 12 year review of 63 cases. *J. of Trauma* 12:490-496, 1972.

Cosman, B. and Wolff, M.
Acne keloidalis. *Plast. and Reconstr. Surg.* 50:25, 1972.

Cosman, B. and Wolff, M.

Correlation of keloid recurrence with completeness of local excision. *Plastic and Reconstr. Surg.* 50:163-166, 1972.

Cosman, B.

Management of the patient with burns. In: *Emergency Room Care*. The Twenty-third Hahnemann Symposium. W. W. Oaks and S. Spitzer, eds. Grune and Stratton, Inc., New York, 1972.

Crikelair, G. F.

Rhinophyma skin grafts. *Plastic and Reconstr. Surg.* 49:98, 1972.

Hourglass maxillary collapse in repaired postalveolar clefts of the palate. *Cleft Palate J.* 9:13-17, 1972.

The question mark ear. *Year Book of Plast. & Reconstr. Surg.* 68-70, 1972.

Crikelair, G. F.; Rein, J. M.; Potter, G. D. and Cosman, B.

A critical look at the "blowout" fracture. *Plast. and Reconstr. Surg.* 49:374-379, 1972.

Driscoll, J. M., Jr; Heird, W. C.; Schullinger, J. N.; Gongaware, R. D. and Winters, R. W.

Total intravenous alimentation in low—Birthweight infants: A preliminary report. *J. of Pediatrics* 81:145, 1972.

- Feind, C. R.
Lymphatics of the head and neck. In: *Lymphatics of Cancer* by C. D. Haagenson, Saunders, Philadelphia, 1972.
- Fierer, J.; LoGerfo, P. and Bennett, S.
Immunofluorescent identification of a tumor associated antigen in neoplastic and non-neoplastic human tissue. *FASEB* (Abstract 32516), 1972.
- Gongaware, R. D.; Rose, J. S.; Berdon, W. E. and Weil, R. III
Intrasplenic foreign body. The use of induced pneumoperitoneum for diagnosis. *Am. J. of Surg.* **124**: 694-696, 1972.
- Gump, F. E.
What mechanisms influence oxygen transport and oxygen tissue delivery in endotoxic and hemorrhagic shock? In: *The Fundamental Mechanisms of Shock*. L. B. Hinshaw, ed., Plenum Press, New York, 1972.
- Gump, F. E.; Sakellariadis, P.; Wolff, M. and Broell, J. R.
Clinical-pathological investigation of regional enteritis as a guide to prognosis. *Ann. Surg.* **176**:233, 1972.
- Gump, F. E.; Zikria, B. A. and Mashima, Y.
The effect of interstitial edema on pulmonary function in the dog. *J. of Trauma* **12**:764, 1972.
- Heird, W. C.; Driscoll, J. M.; Schullinger, J. N.; Grebin, B. and Winters, R. W.
Medical progress: Intravenous alimentation in pediatric patients. *J. of Pediatrics* **80**:351, 1972.
- Heird, W. C.; Nicholson, J. F.; Driscoll, J. M., Jr.; Schullinger, J. N. and Winters, R. W.
Hyperammonemia resulting from intravenous alimentation using a mixture of synthetic L-amino acids: A preliminary report. *J. of Pediatrics* **81**:162, 1972.
- Heird, W. C.; Driscoll, J. M.; Schullinger, J. N.; Grebin, B. and Winters, R. W.
Correspondence — continuous nasogastric infusion versus total intravenous alimentation. *J. of Pediatrics* **81**:1038, 1972.
- Herter, F. P.
Preparation of the bowel for surgery. *Surg. Clin. of North Am.* **52**:829, 1972.
Surgery of the spleen in pregnancy. In: *Surgical Complications in Pregnancy*, H. Barber, ed., Saunders, Philadelphia, 1972.
A surgeon looks at terminal illness. In: *Psychosocial Aspects of Terminal Care*, E. Schoenberg, A. C. Carr, D. Poretz, A. Kutscher, eds. Columbia University Press, New York, 1972.
- Hsu, C. C. S. and LoGerfo, P.
Correlation between alpha globulin and plasma inhibitory effect on PHA stimulated lymphocytes in colon cancer patients. *Proc. Soc. Exp. Biol. and Med.* **139**:575-578, 1972.
- Kaiser, G. A.; Bowman, F. O.; Beach, P. M. and Malm, J. R.
Surgical management of the complications of coronary artery disease. *Cardiology Digest* **7**:18, 1972.
- Kinney, J. M.
Energy expenditure and tissue fuel in the septic patient. Shock in low and high-flow states. Proceedings of a Symposium at Brook Lodge, Augusta, Michigan, June 1-3, 1971. *Excerpta Medica*, Amsterdam, 1972.
- Kinney, J. M. and Caldwell, F. T., Jr.
Fever: Etiology, physiologic and metabolic effects, and management in surgical patients. In: *Davis-Christopher Textbook of Surgery — The Biological Basis of Modern Surgical Practice*. D. C. Sabiston, Jr., ed., Saunders, Philadelphia, 1972.
- Kinney, J. M.
Calories — nitrogen — disease and injury relationships. *AMA Symposium on Total Parenteral Nutrition* sponsored by AMA Food Science Committee, 1972, p. 35.
- LoGerfo, P.; Herter, F. P. and Hansen, H. J.
Tumor associated antigen in patients with colon carcinoma. *Amer. J. Surg.* **123**:127-131, 1972.
Tumor associated antigen in normal lung and colon. *J. Surg. Oncology* **4**:1-7, 1972.
- LoGerfo, P. and Herter, F. P.
Excretion of tritiated 2-23", dimethyl 1-4 diphenylamine. *J. Surg. Oncology* **4**:71, 1972.
- LoGerfo, P.; Herter, F. P.; Braun, J. and Hansen, H. J.
Tumor associated antigen with pulmonary neoplasms. *Ann. of Surg.* **175**:495-500, 1972.
- LoGerfo, P.; Herter, F. P. and Barker, H. G.
Immunological tests for cancer detection. *Surg. Clin. of North Am.* **52**:829:1972.
- LoGerfo, P.; Bennett, S. and Herter, F. P.
Absence of circulating antibodies to carcinoembryonic antigen in patients with gastrointestinal malignancies. *Int. J. Cancer* **9**:344-48, 1972.
- Long, C. L.; Zikria, B. A.; Kinney, J. M. and Geiger, J. W.
Complete intravenous nutrition in critically ill patients. *Fed. Proc.* **31**:704, 1972.
- Malm, J. R.
Management of dissecting aneurysm of the aorta. In: *Changing Concepts in Cardiovascular Disease*. H. I. Russek, and B. L. Zohman, eds., William & Wilkins, Baltimore, 1972.
- Malm, J. R.; Bowman, F. O.; Jesse, M. J.; Hayes, C. J.; Steeg, C. N. and Gersony, W. M.
Technics in management of infants requiring cardiopulmonary bypass. In: *Congenital Cardiac Deffects — Recent Advances*. The National Foundation — March of Dimes. Williams & Wilkins, Baltimore, 1972.
- Malm, J. R.; Hutchinson, J. E., III
Cardiac surgery in children. In: *Cardiac Surgery*, 2d ed., J. C. Norman, ed., Appleton-Century-Crofts, New York, 1972.
- Malm, J. R.
Management of cyanotic congenital heart disease in children. In: *Cardiac Surgery*, 2d ed., J. C. Norman, ed., Appleton-Century-Crofts, New York, 1972.
- Martin, P.; Long, C. L.; Gump, F. E. and Kinney, J. M.
Effect of increased oxygen requirements on red blood cell 2,3 diphosphoglycerate levels. *Surg. Forum* **23**:3, 1972.

- Matolo, N. M.; Reemtsma, K. and DeWitt, C. W.
Effects of cell membranes with and without antilymohocyte serum on skin and heart allograft survival. *Transplantation* 13:265-269, 1972.
- Max, M. H.; Price, J. B., Jr.; Takeshige, K. and Voorhees, A. B., Jr.
The role of factors of portal origin in modifying hepatic regeneration. *J. Surg. Res.* 12:120, 1972.
- Parsa, M. H.; Habif, D. V.; Ferrer, J. M.; Lipton, R. and Yoshimura, N. N.
Intravenous hyperalimentation: Indication, technique, and complications. *Bull. N. Y. Acad. of Med.* 48: 920-42, 1972.
- Parodi, E.; Kaiser, G. A.; Wolff, M.; Kovalik, A. T. W. and Malm, J. R.
Comparative study of the tensile strength of autogenous systemic veins and preserved venous homo-grafts. *J. Surg. Res.* 12:99, 1972.
- Price, J. B., Jr.; Takeshige, K.; Max, M. H. and Voorhees, A. B., Jr.
Glucagon as the portal factor modifying hepatic regeneration. *Surgery* 72:74, 1972.
The role of glucagon and portal factors in hepatic regeneration. *Arch. Franc. Mal. L'Appareil Digestif* 61:657c, 1972.
- Reemtsma, K. and Byrne, J. P.
Lung transplantation. In: *Textbook of Surgery*, D. C. Sabiston, Jr., ed., Saunders, Philadelphia, 1972.
- Reemtsma, K. and Depp, D. A.
Pancreas transplantation. In: *Textbook of Surgery*, D. C. Sabiston, Jr., ed., Saunders, Philadelphia, 1972.
- Renning, J. A.; Warden, G. D.; Stevens, L. E. and Reemtsma, K.
Pancreatitis after renal transplantation. *Am. J. of Surg.* 123:293-96, 1972.
- Santulli, T. V.
Hypertrophic pyloric stenosis. In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
Anorectal malformations. In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
Hernia (diaphragmatic hernia, eventration of the diaphragm, umbilical, inguinal femoral, epigastric), In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
Omphalocele and gastroschisis. In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
Peritonitis. In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
Miscellaneous anal diseases (anorectal abscess, fistula, fissure, prolapse, hemorrhoids). In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
- Santulli, T. V. and Amoury, R. A.
Foreign bodies of the gastrointestinal tract. In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
- Santulli, T. V.
Gastric malformations, gastritis, dilation of the stomach. In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
Gastric perforations. In: *Pediatrics*, H. Barnett, ed., 15th ed., Appleton-Century-Crofts Inc., New York, 1972.
- Slanetz, C. A.; Herter, F. P. and Grinnell, R. S.
Anterior resection versus abdominoperineal resection for cancer of the rectum and dectosigmoid. *Amer. J. Surg.* 123:110-117, 1972.
- Slanetz, C. A. and Herter, F. P.
The lymphatics of the colon and rectum. In: *The Lymphatics in Cancer*, C. D. Haagensen, ed., Saunders, Philadelphia, 1972.
- Sokal, M. M.; Koenigsberger, M. R.; Rose, J. S.; Berdon, W. E. and Santulli, T. V.
Neonatal hypermagnesemia and the meconium plug syndrome. *New Eng. J. Med.* 286:823, 1972.
- Spencer, J. L.; Broell, J. R.; Lee, A. B., Jr.; Kinney, J. M. and Michailoff, T.
A system for the continuous measurement of respiratory function and gas exchange in man without mask or mouthpiece. *J. Appl. Physiol.* 33:523, 1972.
- Stanley, T. H.; Zikria, B. A. and Sullivan, S. F.
The surface tension of tracheobronchial secretions during general anesthesia. *Anesthesiology* 37:445-449, 1972.
- Sutherland, D.; Frech, R. S.; Weill, R.; Najarian, J. S. and Simmons, R. L.
The bleeding cecal ulcer: pathogenesis, angiographic diagnosis, and non-operative control. *Surgery* 71: 290, 1972.
- Triner, L.; Velliemoz, Y.; Verosky, M.; Habif, D. V. and Nahas, G. G.
Cyclic AMP and vascular smooth muscle function. In: *Vascular Smooth Muscle*, E. Betz, ed., Springer-Verlag, 1972.
- Weil, R., III and Reemtsma, K.
Mechanisms of xenograft rejection. *Proceedings of the First International Symposium on Liver Transplantation*, Bonn, June, 1972.
- Winters, R. W.; Santulli, T. V.; Heird, W. C.; Schullinger, J. N. and Driscoll, J. M.
Correspondence — hyperalimentation without sepsis. *N. Eng. J. Med.* 286:321, 1972.
- Zikria, B. A.; Ferrer, J. M. and Floch, H. F.
The chemical factors contributing to pulmonary damage in "smoke poisoning". *Surgery* 71:704-709, 1972.
- Zikria, B. A.; Weston, G. C.; Chodoff, M. and Ferrer, J. M.
Smoke and carbon monoxide poisoning in fire victims. *J. Trauma* 12:641, 1972.

Urology

JOHN K. LATTIMER

Professor and Chairman of the Department • Director of Service

The year 1972 again brought many honors to the staff of the Squier Urological Clinic. Seven prizes for laboratory and clinical research were awarded to residents (Drs. Priestley, Feminella, Horan, Wechsler, Stingle, Mooney and Hanafy) for papers delivered at the New York Section of the American Urological Association's Annual Essay Contest.

Dr. Richard Bard was awarded second prize in the National Contest of the A. U. A. receiving the Grayson Carroll Annual Prize for his paper entitled "Renal and Peripheral Renin Determinations in Renal Artery Stenosis".

At the Annual Meeting of the American Urological Association, Mrs. Katherine F. Jeter, stoma and rehabilitation therapist, won first prize for an exhibit entitled "A Reliable and Efficient Collection Device Which Can Be Applied to the Newly Created Urinary Stoma in the Operating Room". Dr. Stanford Pulrang and Dr. John K. Lattimer also won a prize for an exhibit on the "Bone in the Penis", and Dr. Lattimer and Dr. Bahman F. Vakili won a prize for an exhibit on "Testicular Prosthesis".

During 1972 Dr. John K. Lattimer received world-wide recognition in the press and other news media for his scholarly and intensive study of the medical and ballistic facts in the assassination of President John F. Kennedy. Dr. Lattimer was the first non-governmental expert allowed to examine the autopsy material and his interpretation of the facts, both as a laboratory and field researcher, have helped to dispel much of the doubt surround-

ing the perpetration of the crime. Dr. Lattimer has been a widely sought-after lecturer on these matters, all over the country and has presented talks twice at the P&S Alumni Auditorium, to capacity audiences.

In recognition of his outstanding contributions to Urology, the Buffalo Urological Society honored Dr. Lattimer with its 1972 Award.

During the year 1972 the Department of Urology added Dr. Beatrice C. Seegal, Professor Emeritus of Microbiology, to its research staff, where her skill at cancer immunology and virology were immediately meshed with those of Drs. Konrad Hsu, Myron Tannenbaum and Philip Tomashefsky. Her expertise is most welcome. The Squier Urological Clinic also added to its staff Dr. Arthur M. Smith. Dr. Smith is now an Assistant Professor of Urology and Assistant Attending Urologist at the Babies and Presbyterian Hospitals, concentrating on pediatric urology and urologic oncology. After completing his residency at the Squier Urological Clinic, Dr. Smith was the recipient of the Ferdinand C. Valentine Fellowship from the New York Academy of Medicine and was appointed Special Fellow in Urology at the Memorial Hospital, Sloan-Kettering Cancer Center. He has now rejoined our attending staff.

While there were no major changes in our urological curriculum, we have an increasing number of students seeking electives with our staff both from P&S and other medical schools, and find this a rewarding endeavor.

The Department of Urology is now in the ninth year of its training grant from the National Institutes of Arthritis and Metabolic Diseases and many of our former trainees have academic appointments in all parts of the United States. The year spent in research has produced many fruitful results and the training in teaching and research methods afforded to our second-year residents by this grant has made this possible.

Dr. Meyer M. Melicow, Special Lecturer and Professor Emeritus of Uro-pathology, has continued to give his annual postgraduate course in uro-pathology. This course, which was started in 1960, is most popular and well attended. Lectures on lesions of the adrenal gland (cortex and medulla) kidney, ureter, bladder, prostate, testis and retro-peritoneum are presented. The course is given to prepare for board examinations. To further memorialize Dr. Melicow's contributions to the field of Uro-pathology, the Irene Heinz Given and John La Porte Given Foundation has endowed the "Melicow Urology Library" in recognition of his pioneering educational efforts. Dr. Melicow was invited to be the principal guest lecturer at the biennial South African Urological Congress in the Kenya National Park from August 7-11, 1972. He also gave a lecture at the Fifth Annual Teaching Colloquium of the Dept. of Pathology of P&S at Arden House at Harriman, New York on September 30, 1972. He presented a paper at the 70th Annual Meeting of the New York Section of the American Urological Association in Montreal, Canada on October 22-25, 1972. On November 1, 2, 3, and 4 he took part in the cancer urogenital meeting in Venezuela, Caracas where he delivered four lectures.

Dr. Lattimer delivered the first annual Tracey O. Powell Lecture at the Los Angeles Urological Society on "New Developments Concerning Cancer of the Prostate". Dr. Lattimer also was Visiting Professor at the Kansas City General Hospital and Medical Center, presenting lectures on bladder exstrophy, cryptorchidism, current cancer virus work, antigenic tests for cancer epidemiological data and renal tuberculosis. At the American College of Surgeons meeting, Dr. Lattimer addressed the Committee on Undergraduate Education as a Governor of the American College of Surgeons. He presented a paper on severe psychological problems following exstrophy repair at the American Academy of Pediatrics meeting. Dr. Lattimer was also made President-Elect of the Section on Urology of the American Academy of Pediatrics. Dr. Lattimer was appointed to be Chairman of the Joint Public Relations Committee of the Medical Center.

This committee will advise the Medical Board on matters which would improve the relations between Presbyterian Hospital and the community, its recommendations to be forwarded to the trustees and administration of the Medical Center. This new committee will also work with the Public Interest Department and help in disseminating information on the scientific discoveries made at the Medical Center.

Dr. Aurelio C. Usón presented a paper on the "Prune Belly Syndrome" at the Society for Pediatric Urology and a paper on "Penile Carcinoma" at the New York Section of the American Urological Association meeting held in Montreal.

Dr. Ralph J. Veenema spoke at the American Association of Genito-Urinary Surgeons on "Improved Clinical Definition of Bladder Cancer by Preoperative External Radiotherapy". Dr. Veenema was the official discussant of four papers at the National American Urological Association meeting and spoke on urinary incontinence in the male at the American College of Surgeons meeting in San Francisco.

Dr. Roberto Granato presented exploratory work on the surgical approach to transsexuality with surgical motion pictures and analyses of patients.

Dr. Philip Tomashefsky has overseen the research projects of urology residents and fellows.

Dr. John P. Grant Jr., and Dr. Nicholas A. Romas continue as urological consultants to the transplant team at Francis Delafield Hospital.

The Urology Research Laboratories, under the direction of Dr. Myron Tannenbaum, continued the morphologic and immunopathological studies of genitourinary neoplasms with particular reference to their earlier and more precise diagnosis. Experiments are in progress in the isolation and purification of specific antigens associated with prostatic, renal cervical and other genitourinary cancers. Early experiments have been performed with tissue tests on frozen sections of tumor using fluorescein-labeled antibodies to carcino-embryonic antigen (CEA), tumor-associated antigen (TAA), human immunoglobulins and complement. The 3-layer immunoperoxidase technique which was adapted by Dr. Konrad Hsu (Dept. of Microbiology) has been used on frozen as well as paraffin-embedded specimens. Electron microscopic observations for recognition of malignant cells are being undertaken.

In conjunction with Dr. Earl Zimmerman (Neurology) and Dr. Konrad Hsu, localization of neurosecretory proteins in supraoptic and paraventricular regions of the hypothalamus-pituitary tissues of

monkey and calf, using the indirect immunoperoxidase as well as the three-layer bridge techniques, have been reported. Presently, experiments are in progress in studies of prolactin and alpha fetal globulin in human genitourinary tissues from patients with cancer with the same techniques.

In association with Dr. Margaret Kilcoyne (Medicine) ultra-structural studies were made on renal tissue from eight heroin addicts with clinical nephrotic syndrome. The electron microscopic examination correlated the light microscopic findings of focal membrano-proliferative glomerulonephritis in each of the renal tissues. Electron microscopy confirmed discrete areas of basement-membrane thickening with granular electron dense deposits on the subendothelial aspect. The integrity of the basement membrane was disrupted and the subendothelial space widened by the interposition of additional collections of amorphous electron-opaque material which may represent a fibrin or fibrinogen product. Fibrils with the periodicity of amyloid were absent. Further investigation in clinical and experimental models will be made in order to permit a conclusion as to the sequence which led to the observed histopathological changes in the kidneys of these heroin addicts.

The immunopathological laboratories under Dr. Beatrice C. Seegal, Dr. Konrad Hsu and Dr. Myron Tannenbaum are operated jointly under the Departments of Microbiology, Pathology and Urology. Early experiments on frozen sections of tissues obtained from patients with genitourinary tumors were performed using fluorescein-labeled antibody to carcinoembryonic antigen (CEA). The antisera were kindly supplied by Dr. Hansen, Dr. Wechsler (Urology) and Dr. LoGerfo (Surgery). Subsequently, the three layer immunoperoxidase bridge technique was adapted by Dr. Hsu for use on sections of paraffin-embedded tissues which could be deparaffinized and rehydrated just before the immunologic tests were to be done. The sections could also be counterstained. Two particular advantages are the permanency of the slides and the ability to do this with only bright field microscopy. Preliminary findings were reported at the Second Conference and Workshop on Embryonic and Fetal Antigens in Cancer, Oak Ridge, Tennessee, February 14-16, 1972. Presently, all tumor tissues are being studied with immunofluorescence and immunoperoxidase techniques and by electron microscopy.

Dr. Philip Tomashefsky continued working on the following experiments: Characterization of systemic effects of unilateral nephrectomy. These in-

cluded changes in plasma proteins and free amino acids and in liver growth. Characterization of systemic effects of a transplantable Wilms tumor. These included effects upon plasma protein and liver and kidney. This tumor inhibited renal growth. Development of antigenic response against the Wilms tumor with in vitro monitoring and localization of antibody. Beginning of separation of the Wilms antigen.

Dr. Nicholas A. Romas is studying the utilization of tryptophan inhibitors and their effect on bladder carcinogenesis.

Dr. Arthur M. Smith is continuing his research in the use of alkylating agents in the management of metastatic seminoma and the clinical management of operable Wilms tumor, on which he spoke at the American Academy of Pediatrics in New York, October, 1972. His project work in pediatric urology continues.

Dr. Harry Seneca is continuing his investigations in the treatment of chronic urinary tract infections. Projects on the various cephalosparins and aminoglycosidic antibiotics, as well as sperm hormone and chagas disease, are all under study in Dr. Seneca's laboratories. His textbook entitled *Biological Basis of Chemotherapy of Infections and Infestations* continues to be a main source of information. He gave a course on the management of urinary tract infection in November, 1972 at the Madrid Medical School, sponsored by the Jimenez Diaz Foundation.

Under the aegis of Dr. Ralph J. Veenema, the urological laboratories of the Francis Delafield Hospital pursue the many facets of urological oncology. Dr. Erol E. Gursel, Dr. Myron S. Roberts and Dr. Veenema are working on the latest developments in cryosurgery. Dr. Veenema, Dr. Bruno Fingerhut are working with Dr. S. Graff on nucleic acid synthesis in bladder tumors and Drs. Hanafy and Gursel, radioautography.

Dr. Roger Wiederhorn has been studying serum acid phosphatase levels following prostatic massage and will continue Dr. Feminella's study of patients with cervical cancer and their mates.

Dr. Hans H. Zinsser has completed a 10-year study of pyelonephritis and continues his study of Candididin on more than a hundred patients with benign prostatic hypertrophy. Dr. Zinsser is pursuing sperm studies with Dr. L. B. Shettles and has completed the Septra (Trimethoprim) study. His Pyridium Efficacy Study continues and he has activated a full-scale follow-up on urinary stone cases in the Urology out-patient clinic to seek 15 year results.

Patient care on the Urology Service has been greatly improved through the application of new scientific techniques such as electron microscopy, tissue culture of biopsies, and radioautography, all of which make diagnosis more accurate and therapy more appropriate and, therefore, more effective.

The immediate availability of all new chemotherapeutic drugs, to our patients, as a result of the researches of the staff, have been of very real help.

The Urology Service admitted its 79,836 patient during 1972.

Donors

We are very grateful to all of the donors who have contributed to the support of the work of the department. They are: Mr. and Mrs. Malcolm P. Aldrich, Jack Alpern, Dr. and Mrs. Robert Ambrose, Elmore L. Andrews, Alex Ardrey, Mr. and Mrs. Marcel Armand, Irving R. Arret, Dr. Reginald Auchincloss, Mrs. Rose Avellino, Ayerst Laboratories, BFS Appraisals, Inc., Mrs. Daniel O. Beren, David O. Beren, Miss Marie V. Bergantino, Louis Berkowitz, Mr. and Mrs. Edward D. Bickford, Martin I. Birnbaum, Allen H. Bixen, Mrs. James Bleecker, Dr. Stanley B. Braham, Mrs. Evelyn Brogren, The Brook Foundation, Inc. (The Late Gov. Charles Edison), Robert F. Brown, Burroughs Wellcome & Co., Inc., Mr. and Mrs. William Byrne, The George F. Cahill Fund, Mrs. Reed M. Chambers, Morris I. Chernofsky, Michael Chernow (The Chernow Fund, Inc.), Mrs. Jay I. Chernow, Walter E. Collins, The Commonwealth Fund, W. Palen Conway, Mr. and Mrs. James N. Cost, Edouard L. Cournand, Charles Suydan Cutting, Mr. and Mrs. Alfred D'Arco, Paul H. Davis, F. Trubee Davison, Melvin E. Dawley, Dr. Archie L. Dean, Jr., Dominic DeCurtis, Mrs. John E. Dempsey, Samuel D. Denburg, Dr. Peter N. DeSanctis, Louis Diamond, Bertha Dillon-Susan Douglass Foundation, Inc., Clarence Dillon, Dr. J. Timothy Donovan, Ambassador and Mrs. Lewis W. Douglas (Pantano Foundation), Dow Corning Corporation, Alfred H. Drewes Memorial Fund, Frederick Eaton, Eaton Laboratories, J. R. Elyachar, Friends of the late Albert Ergas, Mrs. Elda K. Esposito, Dr. Charles A. Floor, Dr. Hyman Freedman (Estate of), Mr. and Mrs. Max Freedman, Charles S. Freeman, Ernest H. Froebel, Steven Garry (Estate of), Mr. and Mrs. Norman Gatof, Mr. and Mrs. Paul Gatof, General Mills Foundation, Irene Heinz and John La Porte Given Foundation, Inc., Murray Glaser, Harry Goldman, William Goldsmith, Mr. and Mrs. Oscar Goldstein, Mr. and Mrs. Joseph G. Golub, Mr. and Mrs. Nicholas P.

Goulandris, Dr. John P. Grant, Jr., Harry Greenburg Foundation, Inc., Louis J. Gribetz and Dorothy Gribetz Foundation, Joseph and Carolina Gruss Foundation, Inc., George H. Haley, The John A. Hartford Foundation, Inc., Joseph Heiferman, Dr. Edward Henderson, Mrs. Marion Hensel, Albert M. Herrmann, Mrs. Jerome Hess, Norbert Hess, Allen Hofrichter, Mr. and Mrs. Jac Hohenstein, Mrs. Ben R. Johnson, Mr. and Mrs. Eddie Jonas, Kahn-Markowitz Foundation, William F. Kann (The Kann Foundation, Inc.), Irving G. Kates, Chester B. Keating, Henry Kohn (The Ed Lee and Jean Campe Foundation), Mr. and Mrs. Herbert Korn, Mr. and Mrs. Donald Kramer, Mr. and Mrs. Martin Krasner, Albert Krassner, L & L Foundation, Mr. and Mrs. H. Thomas Langbert, Dr. John K. Lattimer, Lederle Laboratories, Mr. and Mrs. Edgar Lehman, Miss Helen Lemberg, George J. Leness, Dr. Morris F. H. Levy, Manice DeForest Lockwood, Dr. Frank W. Longo, Mr. and Mrs. Dick Manning, Mr. and Mrs. Mitchell Manning, Mrs. Jean Markowitz, Cecile Lehman Mayer Medical Foundation, Clarence F. McCarthy, Mrs. Thomas McGrath, Dr. John A. McElroy, Dr. Meyer M. Melicow, Aaron and Rachel Meyer Memorial Foundation, Inc., Mr. and Mrs. LeRoy Miozzi, Leo Model, Morris and Celia Morgenstern Medical Research Endowment Fund, Rev. and Mrs. Ewald H. Mueller, Charles S. Munson, National Heart Institute, National Institute for Arthritis and Metabolic Diseases, National Institutes of Health, Mr. and Mrs. Marvin Natlin, Mr. and Mrs. Samuel I. Newhouse, Dr. Ian Nisonson, Charles J. Oppenheim, Jr., Organizational Behavior Institute, Inc., Charles J. Pallesen, Jr., Dr. Chang Hwan Park, C. Michael Paul (Charles Ulrich and Josephine Bay Foundation, Inc.), Dr. Harry L. Pelham, Fred and Gertrude Perlberg Foundation, Inc., The Joseph and Grace Perlman Foundation, Pfizer Inc., Spelman Prentice, Mrs. Edith Printz, Dr. Peter J. Puchner, Dr. Stanford Pulrang, Mrs. Martin Ransohoff, J. Squier Reimer, Otto B. Reimer, Benjamin W. Rice, H. Smith Richardson (Smith Richardson Foundation, Inc.), Dr. Myron S. Roberts, Dr. Steven B. Roberts, Dr. John N. Robinson Memorial Fund, Mrs. John N. Robinson (The Widgeon Foundation), Dr. Nicholas A. Romas, Marc J. Rothenberg, Murry M. Rothenberg, Randy Rothman, Michael Scharf (Unimet Corporation), Schering Corporation, Sydney K. Schiff, Julius Schmid, Inc., Mr. and Mrs. John Schreiber, Arnold Schwartz (Brookdale Foundation), F. A. O. Schwarz, Mr. and Mrs. Larry Segal, Herman D. Segel, The Shubert Foundation, Dr. and Mrs. Simeon Siegel, Alex Silber-

stein, Walter H. Simson, Malcolm Smith, Samuel G. Spieler, E. R. Squibb Co., Mrs. Ina Steinberg, John Frederick Steinman Foundation, Leonard M. Stone, Mr. and Mrs. Edward Streim, Milton E. Sullivan, Alexander Summer (Alexander Summer Family Foundation), Mr. and Mrs. Joel Sussman, Dr. Moses Swick, Mr. and Mrs. Meyer Tartasky, Tenneco Inc., Susan Bickford Thomas Memorial Gift for Medical Research, W. Neil Thomas III, Mr. and Mrs. W. Neil Thomas, Jr., Friends and Relatives of the late Susan Bickford Thomas, Mr. and Mrs. Fred Thomases, Mr. and Mrs. Burton Tremaine, U. S. Dept. of Health Education & Wel-

fare (Public Health Service), Staff of U. S. Aviation Underwriters, Mrs. Rankine P. Van Anda, Dr. Ralph J. Veenema, Abraham Vernikov, Oscar A. Villafane, Mr. and Mrs. Edwin G. Vogel Fund, Inc., Lowell Wadmond, DeWitt Wallace Research Gift, Mrs. Charlotte Wank, Stewart Warner, Warner-Lambert Co., The Sidney J. Weinberg Foundation, Zelda Radow Weintraub Cancer Fund, Inc., Mrs. Tess Weisblum, Wellington Foundation, Inc., Mrs. Robert A. Whitaker, William E. Wiegand, Dr. Hans H. Zinsser, Harold Zuckerman (Zuckerman Contractors, Inc.), and Miss Roberta L. Zuhlke (Estate of).

1972 Publications

Urology

Dybner, R.; Jeter, K. and Lattimer, J. K.
Comparison of intraluminal pressures in ileal and colonic conduits in children. *J. Urology*. 108:477-479, 1972.

Ehrlich, R. M.; Hecht, H. L. and Veenema, R. J.
Chyluria following aorto-iliac by-pass graft: Unique method of radiologic diagnosis and review of literature. *J. Urology*. 107:302-303, 1972.

Feminella, J. G., Jr. and Lattimer, J. K.
An apparent increase in genital carcinomas among the wives of men with prostatic cancers: An epidemiological survey. *Pirquet Bull. of Clin. Med.* Vol. 20, No. 6, pp. 3-10, Oct.-Nov. 1972.

Gursel, E.; Fingerhut, B. and Veenema, R. J.
Cellular response to immunotherapy and cryotherapy to induced rat bladder tumor. *Proc. International Congress of Cryosurgery*. p. 53, 1972.

Gursel, E.; Roberts, M. and Veenema, R. J.
Regression of prostatic cancer following sequential cryotherapy to the prostate. *J. Urology*. 108:928-932, 1972.

Regression of prostate cancer following sequential cryotherapy to the prostate. *Proc. International Congress of Cryosurgery*. p. 163, 1972.

Gursel, E. O. and Zinsser, H. H.
Thyrocalcitonin deficiency and urolithiasis: Preliminary report. *N. Y. State J. Med.* Vol. 72, No. 13, pp. 1705-1709, 1972.

Hanafy, H. M.; Gursel, E. and Veenema, R. J.
Possible role of sertoli cells in prostatic cancer refractory to estrogen: A preliminary report. *J. Urology*. 108:914-917, 1972.

Horan, A. and Bedford, J. M.
Development of the fertilizing ability of spermatozoa in the epididymis of the Syrian hamster. *J. Reprod. Fertility*. 30:417-423, 1972.

Jeter, K. F.
Urinary ostomies: A guidebook for patients. *United Ostomy Ass'n*. pp. 1-31, 1972.

Jeter, K. and Bertsch, R. G.
Enterostomal therapy: Better care for the ostomy patient. *Amer. Surgeon*. J. B. Lippincott, Nov. 1972.

Jeter, K. and Bloom, S.
Management of stomal complications following ileal or colonic conduit operations in children. *Urol. Digest*. Vol. 11, No. 8, page 17, Aug. 1972.

Lattimer, J. K.
Radical retropubic prostatectomy in the treatment of carcinoma of the prostate. In: *Current Controversies in Urologic Management*. Essay 2, pp. 85-87, Saunders, 1972.

Observations based on a review of the autopsy photographs, x-rays, and related materials of the late President John F. Kennedy. *Resident and Staff Physician*. pp. 34-63, May 1972.

Urinary frequency and urgency one year after prostatectomy. *J.A.M.A.* Vol. 219, No. 10, page 1351, 1972.

Lattimer, J. K. and Ehrlich, R. M.
Genitourinary tuberculosis. In: *Practice of Surgery*. Urology 1, Chapter 17, Harper & Row, 1971.

Lattimer, J. K.; Lattimer, G. and Lattimer, J.
Could Oswald have shot President Kennedy? Further ballistic studies. *Bull. N. Y. Acad. Med.* Vol. 48, No. 3, pp. 513-524, Apr. 1972

McClennan, B. L. and Becker, J. A.
Excretory urography: Choice of contrast material—Clinical. *Urol. Digest*. Vol. 11, No. 5, page 55, May 1972.

Megalli, M.; Gursel, E. and Lattimer, J. K.
Reflux of urine into ejaculatory ducts as a cause of recurring epididymitis in children. *J. Urology*. 108: 978-979, 1972.

- Melicow, M. M.
Hippocrates, Celsus and Galen — Founders and retarders of urology. *Clin. Medicine*. Vol. 79, pp. 20-26, Apr. 1972.
- Melicow, M. M.; Lattes, R. and Pierre-Louis, C.
Lymphoma of female urethra masquerading as carcinoma. *J. Urology*. 108:748-749, 1972.
- Melicow, M. M. and Tannenbaum, M.
Endometrial carcinoma of uterus masculinus (Prostatic utricle): Report of 6 cases. *J. Urology*. 106: 892-902, 1971.
- Mooney, J. K., Jr.; Horan, A. H. and Lattimer, J. K.
Motility of spermatozoa in the human epididymis. *J. Urology*. 108:443-445, 1972.
- Nelsonson, I. and Lattimer, J. K.
How well can the exstrophied bladder work? *J. Urology*. 107:664-666, 1972.
- Phillips, N. B. and Lattimer, J. K.
Complications and regression of primary tumor size with radiotherapy in prostatic cancer. *J. Urology*. 108: 921-923, 1972.
- Pickens, R. L. and Lattimer, J. K.
Disseminated intravascular coagulation: Diagnosis and treatment of a hemorrhagic diathesis after prostatectomy. *J. Urology*. 108:951-953, 1972.
- Priestley, J. B., Jr.
The laboratory basis for the clinical treatment of Wilms tumor. *J. Urology*. 107:696-704, 1972.
- Romas, N. and Lattimer, J. K.
Reproductive system diseases. In: *The Encyclopaedia Britannica*. W. H. Spector, ed., 1972.
- Rudin, L.; Tannenbaum, M. and Lattimer, J. K.
Histologic analysis of the exstrophied bladder after anatomical closure. *J. Urology*. 108:802-807, 1972.
- Seneca, H.; Uson, A. C. and Peer, P.
Cephalexin in urinary tract infections. *J. Urology*. 107:832-834, 1972.
- Smith, A. M.
Unrecognized lethal pulmonary deterioration during urologic gram-negative sepsis. *J. Urology*. 107:829-831, 1972.
- Smith, A. M. and Veenema, R. J.
Management of rectal injury and retrourethral fistulas following radical retropubic prostatectomy. *J. Urology*. 108:778-779, 1972.
- Stanley, T. H.; Feminella, J. G., Jr.; Priestley, J. B. and Lattimer, J. K.
Subtotal cystectomy and prosthetic bladder replacement. *J. Urology*. 107:783-787, 1972.
- Subramaniam, A. P.; Fernandes, M. and Draper, J. W.
Renal transplant: A new technique in ureteral anastomosis-experimental autotransplantation. *Invest. Urology*. Vol. 9, No. 2, pp. 143-148, 1971.
- Tomashefsky, P.; Furth, J.; Lattimer, J. K. and Tannenbaum, M.
Furth-Columbia rat Wilms tumor. *Trans. A.A.G.U.S.* 63:28-34, 1971.
- Tomashefsky, P.; Furth, J.; Lattimer, J. K.; Tannenbaum, M. and Priestley, J.
Furth-Columbia rat Wilms tumor. *J. Urology*. 107: 348-354, 1972.
- Uson, A. C. and Shulman, C. C.
Ectopic ureter emptying into rectum: Report of a case. *J. Urology*. 108:156-158, 1972.
- Uson, A. C.; Womack, C. and Berdon, W.
Abdominal mass produced by a dilated ureter. *J. Pediatrics*. 80:473-476, 1972.
- Ward, J. N.
Immediate and delayed urological complications following abdomino-perineal resection. *Amer. J. of Surg.* Vol. 123, pp. 642-648, 1972.
- Zinsser, H. H.
Surveying the hormonal characteristics of male infertility patients. *Urologists' Correspondence Club*. Oct. 20, 1972.
- Tribute to William Hammond, M.D. *N. Y. State J. Medicine*. 72, No. 2, June 15, 1972.
- Zinsser, H. H. and Dadfar, H.
Bladder volumes from cystogram films. *Invest. Urology*. Vol. 9, No. 5, 1972.

International Institute for the Study of Human Reproduction

RAYMOND L. VANDE WIELE, *Director*

In the spring of 1972, the International Institute for the Study of Human Reproduction moved several of its divisions into their new quarters at the Bard Haven Facility. This important step in our development has allowed a significant expansion of these divisions and has given a new physical identity to the Institute. While several new members joined our organization, two senior members resigned: Dr. J. C. Ridley took up a position at Georgetown University, while Dr. J. M. Bedford joined the faculty of Cornell University. An administrative reorganization of the Institute is under way, to consolidate the several divisions into three major divisions: a Division of Reproductive Biochemistry and Physiology, a Biomedical Division, and a Division of Social and Administrative Sciences.

The Biochemistry and Physiology of Reproduction

The work in Dr. Seymour Lieberman's laboratory, concerned principally with the biochemistry and metabolism of steroid and protein hormones, has been reported in more detail under the Obstetrics and Gynecology report.

The research in Dr. Raymond Vande Wiele's laboratory, dealing mainly with studies of the mechanisms controlling the reproductive cycle, both in humans and in experimental animals, has also been reported in more detail in the Obstetrics and Gynecology report.

The laboratory of Dr. G. Jagiello has continued to study mammalian meiosis with emphasis on development of an evolutionary scheme for meiotic characteristics and the detection and induction of abnormalities *in vitro* and *in vivo*. The details of the work of this laboratory have been reported in the Obstetrics and Gynecology report.

The laboratory of Dr. J. Michael Bedford (Anatomy) has continued studies of spermatogenesis, sperm transport and the interaction of the female and male gamete. Recent work has involved the investigation of factors influencing sperm passage into the uterine cervix; it was found in the rabbit that neither the presence of seminal plasma nor prostaglandins appear to influence this phase of sperm transport. Comparative studies of co-valent crosslinking within sperm nuclear chromatin have been completed. As previously hypothesized, these results indicate that it is only eutherian mammals in a wide-ranging group of invertebrates and vertebrates studied, which possess cysteine-rich basic nuclear protein. Consideration of the natural history of spermatozoa in the different species suggests that the evolution of coding for cysteine in the synthesis of this protein is related to a structural function demanded by the imposition of the thick resistant coat — the zona pellucida — around the egg of eutherian mammals. The maturation of the sperm tail also appears to involve increased -S-S- crosslinking within the dense fibres and sheath of the sperm tail. Thus maturation of the normal pattern

of sperm motility, usually thought of only in terms of energy mechanisms, must also involve important change in the structural quality of the sperm tail. There has been real doubt as to the existence of a phase of sperm maturation in the human epididymis. Dr. Bedford has studied this process using indirect parameters of acrosome morphology, sperm surface, nuclear structure and motility as indicators. Although, unlike other mammals, there are no changes in the acrosome, major changes in the quality of the surface, the nucleus and the capacity for motility with epididymal passage leave little doubt that there exists an important phase of sperm maturation in the epididymis in men.

Dr. Harold Calvin has continued his studies on cysteine-rich protamines which are peculiar to mammalian sperm. By enzymic degradation, he has shown that the cysteine is homogeneously distributed among the arginines in such proteins and concludes that they probably have evolved by point mutations which resulted in random replacements of arginine by cysteine. He has observed that the crosslinking of the sulfur-rich protamines within the chromatin leads to a highly stable structure which cannot be disrupted by trypsin or DNase or readily penetrated by a potential mutagen such as actinomycin D, unless the -S-S- bonds are reduced with dithiothreitol, suggesting that the crosslinks may serve to protect the DNA of the sperm. Injection of rat and guinea pig protamines and of poly-L-arginine into poly-L-lysine responder guinea pigs have led to severe inhibition of spermatogenesis in 50% of the animals tested. Studies on the biosynthesis of the rat protamine are in progress. The conversion of -SH to -S-S- in both heads and tails of rat, rabbit, and monkey epididymal sperm, first demonstrated qualitatively in collaboration with Dr. Bedford, has been quantitatively estimated with iodoacetamide-C¹⁴. Evidence has been accumulated that most of the free thiol groups measured by this reagent are in the structural proteins of the tail, which also contain high levels of Zn⁺⁺. Dr. Gilles Bleau is undertaking the purification of these Zn⁺⁺-containing proteins from rat sperm tails.

Two projects have been underway in Dr. Muriel Feigelson's laboratory: studies on the proteins of the fluids of the female reproductive tract and the hormonal control of enzymes during development. An estrogen-induced protein from rabbit oviductal fluid has been almost completely purified and its properties and hormonal regulation are being compared with those of blastokinin of uterine fluid. The regulation by sex steroids, glucocorticoids and glucagon of the enzyme, histidase, in rat epidermis,

liver and various cultured hepatoma cell lines have been found to be characteristic for each system; these hormones have been shown to play specific and differing roles in implementing the development *in vivo* of this enzyme in each target tissue.

Family Planning Activities

The Family Life Services staff, under the direction of Dr. Elizabeth B. Connell, has continued to expand its program to provide additional services to the patients of the Columbia-Presbyterian Medical Center and the surrounding community. In order to accomplish this mandate, additional personnel have been added to the staff. Dr. Anne B. Pierson has been appointed Assistant Clinical Professor in Obstetrics and Gynecology and Drs. Milagros Benedicto and Ernesto Bosch have joined the staff as Family Planning fellows. The Family Planning Clinic services have been increased, permitting the program to keep at the Medical Center patients who would otherwise have been referred elsewhere, and to offer improved long-range total care not always possible before.

Through the involvement of Dr. Burton Lerner, psychiatric consultations are available to the patients in the Family Planning Clinic. Patient group activities have also been expanded. For postpartum patients, sessions are now offered in Spanish and English. Several similar night sessions aimed at including husbands in the discussions were also carried out. A follow-up group program was begun for patients after leaving the hospital, some of whom remain undecided on a contraceptive method. These patients are invited back to a special group session held two weeks prior to their scheduled postpartum clinic visit. This technique allows continuity of patient contact as well as program content.

The Unit has continued its liaison with the Family Planning and Guidance Clinic of the Community League of West 159th Street, Inc., working together to conduct and participate in workshops, conferences and programs for community residents and agencies. In conjunction with the Children's Council on Biomedical Careers, a summer program in Education for Family Living was held for neighborhood teen-agers, and sessions are being continued on a year-round basis.

Division of Program Evaluation and Development

As a result of the controversy between Columbia University and the Department of Health, Education, and Welfare over alleged discriminatory practices, the funding of several new contracts from the

Agency of International Development (AID) was blocked, delaying the division's recruitment program by several months.

The division's three overseas Evaluation Units continued to operate, under AID funding, as part of government family planning programs in Ecuador, Salvador and Costa Rica. The division's role in the Ecuador Unit moved into the planned second phase at the end of 1972, with the principal advisor stepping down in favor of his Ecuadorian co-director. Plans for a fourth unit, to operate under private-sector auspices in Brazil, neared completion.

During 1972, the division continued work on several projects initiated in earlier years. The field work in Ecuador for the study of Urban In-Migration and Fertility was completed. Work has continued with the Statistical Dissemination Unit of WHO, in Geneva, on a world program for training health statisticians concerning family planning statistics; an extensive training syllabus had its first use in Bangkok, in mid-November. A Pre/Post Testing Method, originally developed for evaluating training for the Demographic Association of Salvador, was given its second field application at the Government Affairs Institute in Washington, in October. Data for a PAHO-sponsored study in collaboration with the Institute of Nutrition for Central America and Panama (INCAP) on the relation between nutrition and fertility continued to be analyzed, with a meeting of the principals involved in the study held in December. The thesaurus, culled from the Division library's extensive document collection, neared readiness for publication.

Among projects initiated in 1972, the division is now participating in a training program on Population and Family Planning at the University of Rennes (France) School of Public Health—the first program of its kind in any French university. The division has also contributed to the record systems and evaluation of the Haitian Government's newly nationalized family planning program. The first phase of a study of discontinuation proneness among women accepting contraception was carried out in Hong Kong. A longitudinal study of women attending family planning clinics has been undertaken at Harlem Hospital. Work was begun on eliciting computer procedures and statistical techniques from division projects, to be brought together in a procedures manual. A staff project on the development of a family planning evaluation critique book was begun, with new staff devoting much of the latter half of the year to it.

Division of Biomathematics and Demography

Dr. Jeanne Clare Ridley, in collaboration with Dr. Mindel C. Sheps of the University of North Carolina, has continued her computer simulation study of human fertility. During a leave of absence Dr. Ridley served as visiting Professor at the Centro Latino-americano de Demografia in Chile and applied her computer model (Repsim-B) to investigate the impact of family planning programs on Latin-American fertility. After returning to Columbia University she completed the final revision of the Repsim-B technical manual. She also completed a study on the consequences of demographic change for the roles and status of women.

A study of the role and fertility patterns of urban mothers is being directed by Dr. Harriet B. Presser. This study focuses on the determinants and consequences of the age of the mother at first birth. Dr. Presser has also continued to do research in the area of contraceptive sterilization. She and Dr. Larry L. Bumpass of the University of Wisconsin have jointly completed a detailed study of the demographic and social aspects of contraceptive sterilization in the United States, based on survey data from the 1965 and 1970 National Fertility Studies.

A project entitled "Economic Cost and Value of Children in Four Societies" was started under the direction of Dr. Moni Nag. A research assistant has been doing field investigation in each of the following four countries: Indonesia, Nepal, Mexico and United States. Dr. Nag has continued work on his book on the interrelations between culture and human fertility and has written papers on "Population Anthropology" and "Cultural Factors Affecting Family Planning."

Dr. Robert Lewis has continued his research on population change in Russia and the U.S.S.R., and has written papers on "The Mixing of the Russians and the Nationalities and Its Demographic Impact" and "Urbanization in Russia and the U.S.S.R.: 1897-1970."

Division of Reproductive Behavior

The Commonwealth Fund began the supporting of a project to develop a comprehensive program for educating medical students in human sexuality. The coordinator of the program is Dr. Richard Friedman. The emphasis of the educational approach is to integrate sex education into the clinical experience of the student rather than treat it as a separate entity. The goals of the program are to desensitize the students to anxieties that might im-

pare their clinical effectiveness, and to impart basic knowledge about sex. Since the institution of the treatment program in sexual dysfunction at the Medical Center, the Division of Reproductive Behavior under Dr. John O'Connor has been responsible for the evaluation of this clinical program. The importance of the study lies in the fact that it will lead to a rapid evaluation of this new treatment for sexual disorders in an environment away from where it was developed. A project to study mood and behavioral changes during the menstrual cycle has been continued.

Clinical Investigation of Reproductive Function

Dr. Ralph Jewelewicz's study of the prostaglandin, estrogen, and progestational compounds as postcoital contraceptives has been continued.

Dr. Elizabeth Connell has continued a study of the Copper-T intrauterine contraceptive device.

Dr. Ralph M. Richart and Dr. Alex Ferenczy (Pathology), have continued their studies of the normal female genital tract using scanning electron microscopy. These studies have included a detailed examination of the distribution of ciliated and secretory cells in both the endometrial lining epithelium and the endometrial glands during the menstrual cycle, and of the endocervix and the ovarian celomic epithelium. In addition, a detailed analysis of the fine structural characteristics of the endometrium, fallopian tube, and ovarian celomic epithelium has been undertaken, and the data gathered from both studies put together to provide a comprehensive picture of the morphological alterations that occur in normal epithelial cells during the normal menstrual cycle.

Dr. Richart and Dr. Robert Neuwirth (Gynecology) have continued their studies of the development of a transcervical fallopian tube occlusion technique on an outpatient basis. Forty-six patients were studied in collaboration with Dr. Charanpat Isarangkun at Chulalongkorn Medical School, Bangkok, Thailand. These women underwent an outpatient sterilization procedure using hysteroscopically directed electrocoagulation of the tubal ostia and interstitial portions of the tube. A group of

seventeen patients were similarly treated at the Bronx-Lebanon Hospital Center in New York in collaboration with Dr. Richard Levine (Resident in Gynecology). These two series taken collectively have yielded a bilateral tubal occlusion rate in excess of 80 percent. Additional studies are under way to improve the success rate of the procedure and to devise different methods for accomplishing tubal sterilization.

Extramural Activities

Members of the Institute have made many and varied contributions to national and international agencies and projects dealing with human reproduction. They have served as consultants to numerous agencies, including the World Health Organization, Pan American Health Organization and several foreign governments. Members of the Institute have lectured extensively both domestically and abroad and have participated in a variety of symposia. Drs. Bedford, Connell, Jagiello, Lieberman, Nag, Presser, Ridley, Vande Wiele and Wishik have functioned as members of study sections, advisory committees and in other functions to the National Institutes of Health and other National Agencies. The International Institute has started a series of workshops on problems dealing with reproductive function. Miss Judith Anderson serves as Program Coordinator. The first of these conferences dealt with the subject of biorhythms and human reproduction and was held on October 3-8, 1972 at the Sterling Forest Conference Center. The proceedings of the Conference are now in publication. The first symposium for all medical schools in the metropolitan area that offer a rapid treatment program for sexual disorders was sponsored by the Institute in June of 1972.

The Institute gratefully acknowledges support for its work from the following donors: Ford Foundation, Commonwealth Fund, Agency for International Development, National Institutes of Health, Office of Economic Opportunity, World Health Organization, The Population Council, Department of Health, Education and Welfare, New York State Department of Health, The National Foundation, and the Pan-American Health Organization.

1972 Publications

International Institute for the Study of Human Reproduction

Bedford, J. M.

An electron microscopic study of sperm penetration into the rabbit egg after natural mating. *Am. J. Anat.* **133**:213-253, 1972.

Sperm transport, capacitation and fertilization in mammals. In: *Reproductive Biology*. H. Balin and S. Glasser, eds., Excerpta Medica, Amsterdam, 1972.

Bedford, J. M.; Cooper, C. W. and Calvin, H.

Post-meiotic changes in the membranes and nucleus of mammalian spermatozoa. In: *Genetics of the Spermatozoon*. R. A. Beattie and S. Gluecksohn-Waelsch, eds., Forum Printer, Copenhagen, 1972.

Bedford, J. M. and Overstreet, J. W.

A method of objective evaluation of the fertilizing ability of spermatozoa irrespective of genetic character. *J. Reprod. Fert.* **31**:386-394, 1972.

Bogumil, R. J.; Ferin, M.; Rootenberg, J.; Speroff, L. and Vande Wiele, R. L.

Mathematical studies of the human menstrual cycle. I. Formulation of a mathematical model. *J. Clin. Endocr.* **35**:126-143, 1972.

Bogumil, R. L.; Ferin, M. and Vande Wiele, R. L.

Mathematical studies of the human menstrual cycle. II. Simulation performance of a model of the human menstrual cycle. *J. Clin. Endocr.* **35**:144-156, 1972.

Bumpass, Larry L. and Presser, Harriet B.

Contraceptive sterilization in the U. S.; 1965-1970. *Demography* **9**:531-548, 1972.

Cantor, B.; Jewelewicz, R.; Warren, M.; Dyrenfurth, I; Patner A. and Vande Wiele, R. L.

Hormonal changes during induction of mid-trimester abortion by prostaglandin $F_2\alpha$. *Am. J. Obstet. Gynec.* **113**:607-615, 1972.

Carmel, P. W.; Ferin, M.; Zimmermann, E. A.;

Warren, M. P. and Vande Wiele, R. L.
Hypothalamic sites for estrogen control of LH secretion in monkeys. *Proc. IV Internat. Cong. Endocrin.*, Washington, D. C. 1972 (abstract).

Connell, E. B.

The pill in relation to uterine fibromyomas, questions and answers. *Med. Aspects Human Sexuality* **6**:172, 1972.

Gynecologic symptoms of sexual problems. *Ortho Panel 13: Management of Sexual Problems in Medical Practice*, 1972.

Preoperative screening and work-up. *Abortion Techniques and Services - Excerpta Medica* **255**:3, 1971.
Blood clotting and the pill. *Ob-Gyn Collected Letters* **XII**:191, 1971.

Reproductive biology text-chapter on histochemistry of the endometrium. *Excerpta Med. Reproduc. Biol.*, 1972.

The IUD: sex without pregnancy. *Med. Aspects Human Sexuality* **6**:142-167, 1972.

Legal abortion and the hospital's role. *Hosp. Prac.* **7**:143-150, 1972.

Druss, R. G.; O'Connor, J. F. and Stern, L. O.

Changes in body image following ileostomy. *Psychoanalytic Quarterly* **XLI**:195-206, 1972.

Engel, T.; Jewelewicz, R.; Dyrenfurth, I; Speroff, L. and Vande Wiele, R. L.

Ovarian hyperstimulation syndrome - report of a case with notes on pathogenesis and treatment. *Am. J. Obstet. Gynec.* **112**:1052, 1972

Feigelson, Muriel and Kay, Ernest

Protein patterns of rabbit oviducal fluid. *Biol. Reprod.* **6**:244-252, 1972.

Ferenczy, Alex; Fenoglio, John and Richart, Ralph M.

Observations on benign mesothelioma of the genital tract (adenomatoid tumors): A comparative ultrastructural study. *Cancer* **30**:244, 1972.

Ferenczy, Alex and Richart, Ralph M.

The ultrastructure of perianal Paget's disease. *Cancer* **29**:1141-1149, 1972.

The fine structure of the gonads in the complete form of testicular feminization syndrome. *Am. J. Obstet. Gynec.* **113**:399-409, 1972.

Ferenczy, Alex; Richart, Ralph M.;

Agate, Frederick J. Jr.; Purkerson, Mabel L. and Dempsey, Edward W.

Scanning electron microscopy of the human endometrial surface epithelium. *Fertil. Steril.* **23**:515-520, 1972.

Scanning electron microscopy of the human fallopian tube. *Science* **175**:783-784, 1972.

Ferenczy, Alex; Richart, Ralph M. and

Okagaki, Takashi

A comparative ultrastructural study of leiomyosarcoma, cellular leiomyoma and leiomyoma of the uterus. *Cancer* **28**:1004-1018, 1971.

Helbig, Donald W

Statistical aspects of evaluating the impact of family planning on community health program development. *World Health Organization DSI/FPH/72*:1, Geneva, 1972.

Horan, A. H. and Bedford, J. M.

Development of the fertilizing ability of spermatozoa in the epididymis of the Syrian hamster. *J. Reprod. Fert.* **30**:417-423, 1972.

International Institute for the Study of Human Reproduction; Division for Program Development and Evaluation

Glossary of terms used in family planning for a WHO curriculum for a two week workshop in family planning program statistics. New York, 1972.

Izui, Masaru; Richart, Ralph M.; Okagaki, Tashaki and Lattes, Raffaele

Nuclear DNA content in hyperplastic lesions of cystic disease of the breast with special reference to malignant alteration. *Cancer* **28**:620-627, 1971.

Jacobson, L. and Connell, E. B.

The status of patient instruction and oral contraception: 1970. *Advances in Planned Parenthood* **VII**:131, 1972.

- Jagiello, Georgiana; Ducayen, Mercedes and Lin, J. S.
Meiosis suppression by caffeine in female mice.
Molec. Gen. Genet. **118**: 209-214, 1972.
- Jaramillo-Gomez, M.
Documento de trabajo para la elaboracion de un plan
quinquenal de desarrollo de servicios de planificacion
familiar en el Ecuador. *Misiterio de Salud Publica*,
Unidad de evaluacion de Programas de Planificacion
Familiar del Ecuador. Guayaquil, 1972.
Informe sobre actividades de planificacion familiar
en los centros de salud en 1971. *Unidad de Evalua-
cion de Programas de Planificacion Familiar del
Ecuador*. Guayaquil, 1972.
- Jewelewicz, R.; Cantor, B.; Dyrenfurth, I.;
Warren, M. P. and Vande Wiele, R. L.
Intravenous infusion of prostaglandin $F_2\alpha$ in the
mid-luteal phase of the normal human menstrual
cycle. *Prostaglandins* **1**:443-451, 1972.
- Jewelewicz, R.; Dyrenfurth, I.; Warren, M. P. and
Vande Wiele, R. L.
Ovarian hyperstimulation syndrome — relationship
between preovulatory estrogen levels and ovarian
hyperstimulation in gonadotropin treated patients.
*Serono Foundation Workshop Conference on "Gon-
adotropin Therapy in Female Infertility"*, May 12-13,
1972, Worcester, Mass.
- Jewelewicz, R.; James, S. L.; Dyrenfurth, I.;
Warren, M. P. and Vande Wiele, R. L.
Quintuplet gestation following induction of ovulation
with Human Menopausal Gonadotropins (HMG)
and Human Luteinizing Hormone (HLH) — A case
report. *Obstet. Gynec.* **40**:1-5, 1972.
- Kay, Ernest and Feigelson, Muriel
An estrogen modulated protein in rabbit oviducal
fluid. *Biochim. Biophys. Acta* **271**:436-441, 1972.
- Levine, R. U. and Neuwirth, R. S.
Evaluation of a method of hysteroscopy employing
30% dextran. *Am. J. Obstet. Gynec.* **113**:696-703,
1972.
- Lewis, Robert
The mixing of the Russians and the nationalities and
its demographic impact. In: *Soviet Nationality Prob-
lems*. Edward Allworth, ed., Columbia University
Press, New York, 1972.
- Luttrell, Brian; Hochberg, Richard; Dixon, W. Ross;
McDonald, Patrick and Lieberman, Seymour
Studies on the biosynthetic conversion of cholesterol
into pregnenolone: side chain cleavage of a t-butyl
analog of 20 α -hydroxycholesterol, (20R)-20-t-preg-
nene-3 β , 20-diol, a compound completely substituted
at C-22. *J. Biol. Chem.* **247**:1462-1472, 1972.
- Mazzarella, Paul; Okagaki, Takashi and Richart,
Ralph M.
Teratoma of the uterine tube. A case report and
review of the literature. *Obstet. & Gynec.* **39**:381-
388, 1972.
- Nag, Moni
The pattern of mating behavior, emigration and
contraceptives as factors affecting human fertility
in Barbados. *Social and Economic Studies*. **20**:111-
133, 1971.
- Sex, culture and human fertility: India and the
United States. *Current Anthropology*. **13**:231-237,
1972.
- Nagatsu, Masaaki; Richart, Ralph M. and Lambert,
Adrian
Effects of bleomycin on the cell cycle of Ehrlich
ascites carcinoma. *Cancer Research*. **32**:1966-1970,
1972.
- Neuwirth, R. S.
Experience with laparoscopic sterilization related
to termination of pregnancy. *Excerpta Medica*. Pp.
58-62, Amsterdam, 1972.
Un an d'experience de la nouvelle loi sur l'avorte-
ment a New York. *Fertility Orthogenie*. **4**:13, 1972.
- A method of bilateral ovarian biopsy at laparoscopy
in infertility and chronic anovulation. *Fertility &
Sterility*. **23**:361-366, 1972.
- O'Connor, John F. and Stern, Lenore O.
Developmental factors in functional sexual disorders.
N.Y. State J. Med. **72**:1838-1843, 1972.
Results of treatment in functional sexual disorders.
N.Y. State J. Med. **72**:1927-1934, 1972.
- Okagaki, Takashi and Richart, Ralph M.
Systemic proliferating angioendotheliomatosis. A
case report. *Ostet. Gynec.* **37**:377-380, 1971.
- Presser, Harriet B.
The timing of the first birth, female roles and black
fertility. *Milbank Memorial Fund Quarterly*. **49**:329-
361, 1971.
Feminism and the status of women. *Family Planning
Perspectives*. **4**:59-61, 1972.
- Presser, Harriet B. and Bumpass, Larry L.
The acceptability of contraceptive sterilization among
U.S. couples: 1970. *Family Planning Perspectives*. **4**:
18-26, 1972.
- Raziano, J.; Ferin, M. and Vande Wiele, R. L.
Effects of antibodies to estradiol-17 β and to proges-
terone on nidation and pregnancy in rats. *Endo-
crinology*. **90**:1133-1138, 1972.
- Richart, Ralph M. and Prager, Denis J. (eds.)
Human Sterilization. Charles C. Thomas Publisher,
Springfield, Illinois, 1972.
- Ridley, J. C.
The changing position of American women: educa-
tion, labor force participation, and fertility. In: Fo-
garty International Center, Proceedings No. 3: *The
Family in Transition*. N.I.H., 1971.
Women's changing status. In: Fogarty International
Center, Proceedings No. 3: *The Family in Transition*.
N.I.H., 1971.
The effects of population change on the roles of
women: perspective and speculation. In: *The Sociol-
ogy of Women*. C. Safilios-Rothschild, ed., Xerox
College Publishing Company, Lexington, Massachu-
setts, 1972.
On the consequences of demographic change for the
roles and status of women. In: Commission on *Pop-
ulation Growth*, Vol. I. Government Printing Office,
Washington, D. C., 1972.

Ridley, J. C. and Clague, A. S.

On births averted: assessment of three methods of estimation. In: *Proceedings of the Conference on the Uses of Computer Simulation in Human Population*. Pennsylvania State College, Pennsylvania State University, 1972.

Rodriguez, Modesto; Okagaki, Takashi and Richart, Ralph M.

Mycotic endometritis due to candida. Report of a case and review of the literature. *Obstet. Gynec.* **39**: 292-294, 1972.

Rosner, William and Hochberg, Richard

Corticosteroid-binding globulin in the rat: isolation and studies of its influence on cortisol action *in vivo*. *Endocrinol.* **91**:621-632, 1972.

Thrasher, Thais V. and Richart, Ralph M.

An ultrastructural comparison of endometrial adenocarcinoma and normal epithelium. *Cancer.* **29**:1713-1723, 1972.

Ultrastructure of the arias stella reaction. *Amer. J. Obstet. & Gynec.* **112**:113, 1972.

Topal, S.; Neuwirth, R. S. and Lazarevic, B.

Variations of ectopic pregnancy as seen at laparoscopy. *J. Reprod. Med.* **8**:26, 1972.

Vasudeva, Kusum; Thrasher, Thais V. and Richart, Ralph M.

Chronic endometritis: a clinical and electron microscopic study. *Amer. J. Obstet. & Gynec.* **112**:749-758, 1972.

Weiss, R.; Neuwirth, R. S. and Friedman, M.M.

The effect of sodium concentration in the amniotic fluid on the outcome of saline induced abortion. *Amer. J. Obstet. & Gynec.* **40**:243, 1972.

Wishik, S. M.

Considerations in the development of national goals. In: *Western Hemisphere Nutrition Congress, III: Proceedings*. Philip L. White, ed., Futura, Mt. Kisco, N. Y., 1972.

Organization, administration and evaluation of family planning programs; the physician's role in education and communication; the physician's role in helping a women choose a contraceptive method; the population problem and family planning. Conference on "The Teaching of Family Planning, Human Reproduction and Population Dynamics in Medical Schools" (Kuala Lumpur, Oct. 1971), working papers; Western Pacific Regional Office, *World Health Organization*, Manila, 1972.

Wishik, S. M. and Helbig, Donald W.

The fertility pattern method: estimation of fertility change by retrospective quasi-cohort analysis of group specific fertility patterns. *International Institute for the Study of Human Reproduction, Division for Program Development*, New York, 1972.

Wishik, S. M.; Shimmel, Julia and Ramaprasad, Rukmani

A study of family planning service and distribution patterns in selected areas of New York City and factors affecting clinic attendance. *International Institute for the Study of Human Reproduction, Division for Program Development and Evaluation*, New York, 1972.

Institute of Cancer Research

SOL SPIEGELMAN, *Director*

The Institute of Cancer Research continues a broad-based and multidisciplinary approach in its attempt at a better understanding of the cancer problem and its control. The research areas include viral oncology, immunological aspects of cancer, chemical carcinogenesis, and the regulation of cell activity.

The new laboratory facilities have been completed and were occupied during the past year. The space added provides 3500 square feet of laboratories for new and expanded efforts and includes a maximum containment laboratory that permits the isolation and handling of candidate viruses suspected as etiological agents for human cancer.

Research Activities

Dr. Spiegelman and his associates have focused their efforts on a search for evidence for viral agents in a variety of human cancers. They are employing the basic techniques of molecular biology, including molecular hybridization, to detect evidence in human neoplasias of viral agents analogous to those known to cause similar diseases in experimental animals.

Drs. Spiegelman and Schlom have developed a test that simultaneously detects the presence of an RNA-instructed DNA polymerase in association with a 70S RNA molecule, two properties unique to the RNA tumor viruses. This simultaneous detection test has been successfully applied to particles from human milk.

Using the mouse mammary tumor as a model, Doctors Schlom, Axel, and Spiegelman developed the techniques required to detect the viral-specified RNA in malignant tissue. This method was then

applied to human breast cancers. A large proportion of the specimens examined did indeed contain RNA homologous to the RNA found in the mouse mammary tumor virus, an agent which causes a similar disease in mice. Normal adult tissues or benign breast tumors did not show detectable amounts of this tumor-specific RNA.

As soon as positive results began to emerge in the breast cancer studies a parallel investigation was instituted by Drs. Hehlmann, Kufe, and Spiegelman in human leukemias, lymphomas, and sarcomas. The white blood cells of 46 out of 50 patients examined contained RNA possessing homology to that of the mouse leukemia agent. Further, no control human white blood cells or other adult or fetal tissues showed significant levels of the leukemia-specific RNA. The results establish that human leukemic cells contain RNA sequences homologous to those found in a viral agent known to cause leukemia in an experimental animal.

It is known in the mouse experimental system that sarcomas and lymphomas are caused by viral agents that are closely related to those that cause leukemia. Because of this fact, human sarcomas and lymphomas, including Hodgkins' disease, were subjected to a similar type of analysis. It was found indeed that human sarcomas and human lymphomas both contain RNA that is homologous in sequences to that of the mouse leukemogenic virus. Again, normal adult or fetal tissues were found to be devoid of this specific type of RNA. The pattern of RNA types found in the human cancers thus far examined shows a remarkable parallelism in their specificities to that which has

been observed in the mouse system. These data provide the first telling evidence that viruses similar to those found in corresponding cancers in animals may well be involved in the pathogenesis of these diseases in man.

Drs. Spiegelman, Kacian, and Watson have purified the DNA polymerase from avian myeloblastosis virus and have shown that the enzyme consists of two subunits of molecular weights 110,000 and 69,000. The availability of a purified RNA-instructed DNA polymerase (reverse transcriptase) provided the opportunity to explore whether this enzyme could be used as a general tool for synthesizing DNA complements of a wide variety of natural RNAs. The results obtained show that this potentially useful situation is in fact realized. These findings opened up novel pathways for the experimental resolution of several interesting problems. Thus, given a purified RNA message, one should be able to synthesize the corresponding DNA genetic material. Drs. Spiegelman and Kacian, in collaboration with Drs. Bank, Terada, Metafore, Dow, and Marks, succeeded in doing this with the human RNA message for hemoglobin. If suitably labeled, the synthetic DNA has obvious uses, including its use via molecular hybridization as an analytical probe for the corresponding gene on the chromosomes or for its message in a complex mixture of RNA molecules.

Doctors Mills, Kramer, Nishihara, Cole, and Spiegelman have been experimenting with the replication of an RNA molecule that was suitable for a detailed analysis of extracellular evolution and replication. The molecule they isolated had the following properties: 1) It replicates *in vitro* in a manner similar to phage Q β RNA; 2) It produces antiparallel complementary strands that can be separated from one another; and 3) It is small enough to yield its sequence with reasonable effort. This RNA molecule contains 218 nucleotides and possesses the other features desired for a definitive analysis of the replicating mechanism. Despite its small size, this molecule can mutate to previously determined phenotypes. It will permit therefore the precise identification of the base changes required to mutate from one phenotype to another in the course of extracellular Darwinian selection experiments.

Professor P. Feigelson's laboratory has continued studies attempting to elucidate the biochemical events that mediate the glucocorticoidal regulation of gene expression, ribosomal RNA synthesis, and enzyme induction. These studies have several facts. A protein has been identified in the hepatic cytosol,

which binds natural and synthetic glucocorticoids with high affinity, $K_a=10^9 M^{-1}$. Its affinity for various steroids correlates with their glucocorticoid activity, and it contains essential SH moieties. *In vivo* studies indicate proportional saturation of this steroid-binding protein and the degree of enzyme induction. Both *in vivo* and *in vitro* studies indicate that this protein transports the steroid hormone into the nucleus. These and other studies support the view that this specific high affinity steroid-binding protein is a functional glucocorticoidal "receptor" protein.

In vitro tracer incorporation studies previously established that glucocorticoids markedly enhanced ribosomal RNA synthesis. To enable exploration of the underlying biochemical events, procedures were derived enabling the isolation of hepatic nucleoli, which retained hormonally enhanced nucleolar RNA polymerase I activities under *in vitro* conditions. Comparison of these nucleolar RNA polymerase activities, acting upon the endogenous DNA chromatin as template, with those observed when the enzyme utilizes a saturation level of exogenous synthetic poly d-A-T template, enabled us to ascertain that the enhanced rate of ribosomal RNA synthesis by hepatic nucleoli derived from hormone-treated animals was due to enhanced activity of RNA polymerase enzyme *per se* and not to increased availability (derepression) of the genome, which contains the genetic information for ribosomal precursor RNA synthesis. These findings indicate nucleolar RNA polymerase I to be a hormonally inducible enzyme.

Studies monitoring the rates at which the RNA polymerases of nucleoplasmic and nucleolar origin diminish *in vivo* following cycloheximide or actinomycin D administration indicate the nucleoplasmic RNA polymerases II and III to be metabolically long-lived, whereas both the nucleolar RNA polymerase I protein and the mRNA, which codes for its synthesis, are among the most rapidly turning over hepatic macromolecular species. Thus, ribosomal RNA synthesis is potentially readily subject to transcriptional, translational, and/or post-translational control.

Dr. J. Furth, with associate Dr. A. Ito and collaborators from other universities, has been investigating the derangements of homeostasis which lead to neoplasia. This is done by stimulation and/or inhibition of the vital homeostatic centers mainly by hormones or related agents, with or without carcinogens. The principal adjunct techniques are hormone assays, immunohistochemical staining (IHCS), transplantation assays, and tests for hor-

mone responsiveness in relation to neoplastic transformation of normal cells and growth of transformed (dependent and autonomous) tumor cells.

All five pituitary systems are being studied, especially the mammotropemammary gland and thyrotrope-thyroid gland axes. These led to the conclusion that whereas normal cells have a fixed and limited range of potentialities, their genetic code is scrambled when they acquire autonomy. This is due either to derepression of the differentiated code or to mutation. (The magnitude of derangement, if any, in dependent tumors is yet to be analyzed.) It was discovered that neoplastic mammotropic cells can secrete two or three hormones—prolactin (P), growth hormone (GH), and corticotropin (AtH). Our old biologic observation that thyrotropic tumors (TtTs) have gonadotropic and somatotropic activities has been clarified by IHCS with antisera to the α and β subunits of Canfield and Ross. The manifestation and pathophysiology of multiglandular diseases in man are basically identical with those of experimental animals.

Three investigators found independently that Dr. Furth's originally prolactin-secreting tumor changed to one secreting GH only. Confirming this observation, it was found that these GH tumors have vestigial biologic mammotropic activity. This points to some interrelationship between the two acidophilic polypeptides: GH and P. (Acromegaly, the human GH tumor, frequently goes with gynecomastia.)

In two comprehensive reviews, the pathophysiology of diverse pituitary-related neoplasms was surveyed, incorporating numerous unpublished recent observations from Dr. Furth's laboratory. These point to the need for further intensified research on the hypophyseal-hypothalamic system. Attempts are being continued to develop functional gonadotropic and related tumors that are not now available and to devise a simple *in vitro* procedure for differentiation of dependent from autonomous neoplastic cells.

The laboratory of Dr. Elliott Osserman and his associates has continued to pursue coordinated clinical, biochemical and immunologic investigations of plasmacytic and monocytic dyscrasias. The clinical activities of this group are described in the report of the Department of Medicine. In the past year, particular emphasis has been given to investigations of the effects of lysozyme on mammalian cells in tissue culture. These studies have been done in collaboration with Drs. Matti Klockars and James Halper, and Robert Fischel (P&S '74). Using homologous mammalian lysozymes, i.e., human lysozyme isolated from the urines of patients with monocytic leukemia tested on human cell lines,

and rat lysozyme isolated from the urines of rats bearing the transplantable Shay chloroleukemia on murine cell lines, very striking cytologic effects of lysozyme have been demonstrated. The fact that lysozyme did not significantly inhibit either the proliferative rates (as measured by direct cell counting) or the uptake of tritiated thymidine indicated that these lysozyme effects were not simply the result of non-specific toxicity.

In order to define further the effects of lysozyme on cultured mammalian cells, some preliminary studies were carried out in the laboratory of Prof. Marcel Bessis at the Institute of Cellular Pathology in Paris using the techniques of scanning and transmission electron microscopy. These studies were performed on a human liver cell line that had undergone spontaneous transformation *in vitro*. When cultured in the presence of human lysozyme, these cells were found to be markedly flattened and widely spread on the supporting glass surface, and very long filamentous cytoplasmic projections were again demonstrated. When these cells were sectioned and examined by transmission electron microscopy, the lysozyme-treated cells showed more normal-appearing mitochondria and polyribosomes than the control cultures, as well as a marked decrease in perinuclear fat droplets.

In related studies, carried out by Dr. Matteo Adinolfi and Dr. John Loeb, lysozyme has been demonstrated to agglutinate isolated rat liver mitochondria, and this agglutination has been shown to be inhibited by concanavalin A. Ribonuclease, cytochrome C and protamine, which are similar to lysozyme in being low molecular weight cationic proteins, did not agglutinate mitochondria indicating that the lysozyme effect is apparently specific. In conjunction with the previously described cellular effects, the present evidence would strongly indicate that lysozyme interacts with certain constituents of mammalian cell membranes, presumably polysaccharides, to produce effects that may be of considerable biological significance.

Drs. I. Bernard Weinstein and Dezider Grunberger have continued studies on the molecular aspects of chemical carcinogenesis. Evidence has been obtained that the liver carcinogen N-2-acetylaminofluorene (AAF) binds covalently to guanine residues in nucleic acids producing specific changes in their three dimensional structure and function. The major structural changes include rotation of the guanine base around the glycosidic linkage and the intramolecular stacking of the carcinogen with adjacent base residues in nucleic acids. These distortions in nucleic acid conformation explain certain mutagenic and other biologic

effects of this carcinogen. Several chemical carcinogens bind *in vivo* not only to DNA but also to transfer RNA. Nucleotide sequence studies indicate that AAF binds specifically to a guanine residue in the dihydrouridine loop of formylmethionine tRNA resulting in inhibition of its amino acid acceptance capacity. These findings exemplify the specificity of carcinogens in their attack on nucleic acids.

Drs. Weinstein and Grunberger, in collaboration with Dr. Koji Nakanishi (Chemistry), have elucidated the structure of an unusual fluorescent nucleoside, the Ybase, present in yeast phenylalanine tRNA. This base is a three-ring derivative of guanine with a complex 4-carbon side chain. It is the most complex component of nucleic acid found thus far in nature. The structure of a related base present in mammalian tRNA has also been elucidated and differs from the Y base only by the presence of a hydroperoxy group on the side chain.

To study the mechanism of chemical carcinogenesis at the cellular level, Dr. Weinstein has developed an assay system in which normal rat liver cells are grown in tissue culture and can be transformed into tumor cells by *in vitro* exposure to liver carcinogens. The transformed cells synthesize a C-type RNA virus that is not present in the normal cell cultures. The role of this virus in the action of chemical carcinogens is under current investigation.

With the purpose of designing new inhibitors of growth, Dr. Grunberger studied two types of nucleic acid analogs. In collaboration with Drs. J. and P. M. Pitha from Johns Hopkins School of Medicine, poly(9-vinyladenine), and poly(1-vinyluracil) were prepared and found that they are potent inhibitors of complementary polynucleotide-stimulated aminoacyl-tRNA binding to ribosomes and amino acid incorporation into proteins.

In collaboration with Dr. E. Reich from the Rockefeller University, they have shown that the purine nucleoside analogue, 7-deazanebularin, could replace fully adenosine and only partly guanosine in trinucleotide codons or in polynucleotides directing polypeptide synthesis.

Extramural Activities and Honors

Dr. Spiegelman was appointed to the National Cancer Advisory Board and elected as Foreign Member to the National Academy of Medicine of Brazil. He is also the recipient of the Townsend Harris Medal for 1972 from the Alumni Association of the City College of New York and the Lila Gruber Award in Cancer Research of the American Academy of Dermatology. He delivered the First Edwin W. Schultz Memorial Lecture at Stanford

University and was the Gregory Lecturer at Colgate University. Dr. Spiegelman spoke at the dedication ceremonies of the Bio-Science Laboratory in honor of Dr. Detlev W. Bronk at Rensselaer Polytechnic Institute. During the past year, Dr. Spiegelman also was an invited lecturer at: the Shima Conference on Leukemia in Japan; the Plenary Lecturer at the 8th Federation European Biochem. Societies in Amsterdam, The Netherlands; the opening of the Max-Planck Institute for Biophysical Chemistry in Göttingen, Germany; the EMBO Workshop on Cell Differentiation in Switzerland; as well as at the University of Tel-Aviv and Hebrew University Schools of Medicine in Israel.

In the past year, Dr. Osseman continued to serve on the Cancer Centers Review Committee of the National Cancer Institute. At the XIVth Congress of the International Society of Hematology in São Paulo, Brazil, he was awarded the Ehrlich medal for outstanding contributions to hematology. He was also elected to honorary membership in the National Academy of Medicine of Brazil.

To mark the 50th anniversary of the discovery of lysozyme by Sir Alexander Fleming, an international conference covering both the basic biochemical and applied clinical aspects of this enzyme system was held under the sponsorship of the Institute of Cancer Research. Over 90 scientists from eight foreign countries and the United States participated, and Lady Amalia Fleming served as honorary chairman.

Dr. Weinstein served as editor of a series of workshops on chemical carcinogenesis, sponsored by the Interdisciplinary Communications Program of the Smithsonian Institution; as a member of the Carcinogenesis Core Group of the National Cancer Institute; as an advisor to the Lung Cancer Segment of the National Cancer Institute; as a member of the Pharmacology B Study Section of the National Institutes of Health.

Acknowledgments

We gratefully acknowledge the support of the American Cancer Society, American Cancer Society (New York City Division), Atomic Energy Commission, George Crocker Special Research Fund, Damon Runyon Memorial Fund for Cancer Research, Health Research Council of the City of New York, Hoffman-LaRoche, Inc., International Union Against Cancer, Kallestad Laboratories, Leukemia Society of America, National Institutes of Health, National Science Foundation, Alton Toorock Memorial for Cancer Research, Inc., The Zelda Radow Weintraub Cancer Fund and the Anne Winton Cancer and Service League.

1972 Publications

Institute of Cancer Research

- Axel, R.; Schlom, J. and Spiegelman, S.
Presence in human breast cancer of RNA homologous to mouse mammary tumor virus RNA. *Nature* **235**:32-36, 1972.
Evidence for translation of viral-specific RNA in cells of a mouse mammary carcinoma. *Proc. Natl. Acad. Sci. USA* **69**:535-538, 1972.
- Beato, M.; Kalimi, M. and Feigelson, P.
Correlation between glucocorticoid binding to specific liver cytosol receptors and enzyme induction *in vivo*. *Biochem. Biophys. Res. Comm.* **47**:1464, 1972.
- Bishop, D. H. L.; Ruprecht, R.; Simpson, R. W. and Spiegelman, S.
Deoxyribonucleic acid polymerase of Rous sarcoma virus: Reaction conditions and analysis of the reaction product nucleic acids. *J. Virology* **8**:730-741, 1971.
- Bomford, R. and Weinstein, I. B.
Transformation of a rat epithelial-like cell line by murine sarcoma virus. *J. Natl. Cancer Inst.* **49**:379-386, 1972.
- Brady, F. O.; Forman, H. J. and Feigelson, P.
The role of superoxide and hydroperoxide in the reductive activation of tryptophan -2,3-dioxygenase. *J. Biol. Chem.* **246**:7119, 1971.
- Cheng, C. J.; Fujimura, S.; Grunberger, D. and Weinstein, I. B.
Interaction of 1-(chloroethyl)-3-cyclohexyl-1-nitrosourea (NSC 79037) with nucleic acids and proteins *in vivo* and *in vitro*. *Cancer Res.* **32**:22-27, 1972.
- Forman, H. J. and Feigelson, P.
The effect of allosteric interactions on the kinetics, spectra, and tertiary structure of pseudomonad tryptophan oxygenase. *J. Biol. Chem.* **247**:256, 1972.
- Furth, J.
Epilogue to a symposium on mammary neoplasia: Quo vadis? *J. Natl. Cancer Inst.* **48**:1235, 1972.
Prolactin and Carcinogenesis. In: *Prolactin and Carcinogenesis. Fourth Tenovus Workshop*, A. R. Boyns and K. Griffiths, eds., Alpha Omega Alpha Publishing, Cardiff, Wales, 1972.
- Fujimura, S.; Grunberger, D.; Carvajal, G. and Weinstein, I. B.
Modifications of ribonucleic acid by chemical carcinogens. Modification of *Escherichia coli* formylmethionine transfer ribonucleic acid with N-acetoxy-2-acetylaminofluorene. *Biochemistry* **11**:3629, 1972.
- Goodman, N. C. and Spiegelman, S.
Distinguishing reverse transcriptase of an RNA tumor virus from other known DNA polymerases. *Proc. Natl. Acad. Sci. USA* **68**:2203-2206, 1971.
- Grunberger, D.; Weinstein, I. B.; Fink, L. M.; Nelson, J. H. and Cantor, C. R.
Interaction of N-2-acetylaminofluorene with RNA. "Research Symposium on Complexes of Biologically Active Substances with Nucleic Acids and their Modes of Action," Walter Reed Army Institute of Research, Washington, D.C. In: *Progress in Molecular and Subcellular Biology*, Vol. 2, F. Hahn, ed., Springer Verlag, Berlin-Heidelberg-New York, 1972.
- Grunberger, D.; Ward, D. C. and Reich, E.
7-Deazanebularin: Coding properties of triplets and polynucleotides. *J. Biol. Chem.* **247**:720-724, 1972.
- Gulati, S. C.; Axel, R. and Spiegelman, S.
Detection of RNA-instructed DNA polymerase and high molecular weight RNA in malignant tissue. *Proc. Natl. Acad. Sci. USA* **69**:2020-2024, 1972.
- Hanafusa, H.; Baltimore, D.; Smoler, D.; Watson, K. F.; Yaniv, A. and Spiegelman, S.
Absence of polymerase protein in virions of alpha-type Rous sarcoma virus. *Science* **177**:1188-1191, 1972.
- Harter, D. H.; Schlom, J.; Burny, A. and Spiegelman, S.
Visna virus: A 'slow' neurotropic agent with tumor virus properties. *Trans. Amer. Neurol. Assoc.* **96**, 1971.
- Hehlmann, R.; Kufe, D. and Spiegelman, S.
RNA in human leukemic cells related to the RNA of a mouse leukemia virus. *Proc. Natl. Acad. Sci. USA* **69**:435-439, 1972.
Viral-related RNA in Hodgkins' disease and other human lymphomas. *Proc. Natl. Acad. Sci. USA* **69**:1727-1731, 1972.
- Isobe, T. and Osseman, E. F.
Pathologic conditions associated with plasma cell dyscrasias: A study of 806 cases. *Ann. N. Y. Acad. Sci.* **190**:507, 1971.
- Ito, A.; Furth, J. and Moy, P.
Growth hormone-secreting variants of a mammary tumor. *Cancer Res.* **32**:48, 1972.
- Ito, A.; Moy, P.; Kaunitz, H.; Kortwright, K.; Clarke, S.; Furth, J. and Meites, J.
Incidence and character of the spontaneous pituitary tumors in strain CR and W/Fu male rats. *J. Natl. Cancer Inst.* **49**:701, 1972.
- Kacian, D. L.; Spiegelman, S.; Bank, A.; Terada, M.; Metafora, S.; Dow, L. and Marks, P. A.
In vitro synthesis of DNA components of human genes for globins. *Nature New Biology* **235**:167-169, 1972.
- Kacian, D. L.; Mills, D. R.; Kramer, F. R. and Spiegelman, S.
A replicating RNA molecule suitable for a detailed analysis of extracellular evolution and replication. *Proc. Natl. Acad. Sci. USA* **69**:3038-3042, 1972.
- Koike, K. and Feigelson, P.
Studies on the roles of the catalytic and allosteric sites in modulating and reactivity of tryptophan oxygenase with heme ligands. I. The cyanide derivatives. *Biochemistry* **10**:3378, 1971.
Studies on the catalytic and allosteric sites in modulating the reactivity of tryptophan oxygenase with heme ligands. II. The carbon monoxide derivatives. *Biochemistry* **10**:3385, 1971.

- Kufe, D.; Hehlmann, R. and Spiegelman, S.
Human sarcomas contain RNA related to the RNA of a mouse leukemia virus. *Science* **175**:182-185, 1972.
- Nakanishi, K.; Blobstein, S.; Funamizu, M.; Furutachi, N.; Van Lear, G.; Grunberger, D.; Lanks, K. W. and Weinstein, I. B.
Structure of the "peroxy-y base" from liver tRNA^{Phe}. *Nature New Biology* **234**:107, 1971.
- Nelson, J. H.; Grunberger, D.; Cantor, C. R. and Weinstein, I. B.
Modification of ribonucleic acid by chemical carcinogens. IV. Circular dichroism and proton magnetic resonance studies of oligonucleotides modified with N-2-acetylaminofluorene. *J. Mol. Biol.* **62**:331-346, 1971.
- Ohta, H. and Osserman, E. F.
Hydrolytic enzymes of human blood monocytes and neutrophils with special reference to lysozyme (muramidase). *Tohoku J. Exptl. Med.* **107**:229, 1972.
- Osserman, E. F.; Takatsuki, K.; Farhangi, M.; Pick, A. I. and Isobe, T.
Plasma cell dyscrasias: general considerations; plasma cell myeloma; primary macroglobulinemia; amyloidosis; heavy chain diseases. In: *Hematology*, Edited by Williams et al., McGraw-Hill, N. Y. pp. 950-984, 1972.
- Reynolds, F.; Grunberger, D.; Pitha, J. and Pitha, P. M.
Inhibition of cell-free protein synthesis by poly(9-vinyladenine), poly(1-vinyluracil), and the corresponding vinyl copolymer. *Biochemistry* **11**:3261-3266, 1972.
- Schlom, J. and Spiegelman, S.
Simultaneous detection of reverse transcriptase and high molecular weight RNA unique to oncogenic RNA viruses. *Science* **174**:840-843, 1971.
- Schlom, J.; Spiegelman, S. and Moore, D. H.
Detection of high molecular weight RNA in particles from human milk. *Science* **175**:542-544, 1972.
Reverse transcriptase and high molecular weight RNA in particles from mouse and human milk. *J. Natl. Cancer Inst.* **48**:1197-1203, 1972.
- Schutz, G.; Chow, E. and Feigelson, P.
Regulatory properties of hepatic tryptophan oxygenase. *J. Biol. Chem.* **247**:5333, 1972.
- Schutz, G. and Feigelson, P.
Thermal activation of hepatic tryptophan oxygenase enabling expression of total enzyme activity. *Analytical Biochemistry* **46**:149, 1972.
Purification and properties of rat liver tryptophan oxygenase. *J. Biol. Chem.* **247**:5327, 1972.
- Spiegelman, S.
Extracellular strategies of a replicating RNA genome. In: *CIBA Foundation Symposium on Strategy of the Viral Genome*, G. E. W. Wolstenholme and Maevs O'Connor, eds., Churchill Livingstone, London, pp. 45-73, 1971.
An approach to the experimental analysis of precellular evolution. Nobel Workshop, Stockholm, Quarterly Reviews of Biophysics **4**:213-253, 1971.
Discussion to Viral Oncology. In: *Nucleic Acid Protein Interactions*, D. W. Ribbons, ed., J. F. Woessner and J. Schultz, North-Holland Publishing Co., Amsterdam, pp. 490-494, 1972.
- Spiegelman, S.; Axel, R., and Schlom, J.
Virus-related RNA in human and mouse mammary tumors. *J. Natl. Cancer Inst.* **48**:1205-1211, 1972.
- Spiegelman, S.; and Schlom, J.
Reverse transcriptase in oncogenic RNA viruses. In: *Virus-Cell Interactions and Viral Antimetabolites*, D. Shugar, ed., Academic Press, London, pp. 115-137 (FEBS Symposium) 1972.
- Spiegelman, S.; Watson, K. F., and Kacian, D. L.
Synthesis of DNA complements of natural RNAs. A general approach. *Proc. Natl. Acad. Sci. USA* **68**:2843-2845, 1971.
- Ward, D. C.; Humphries, K. C., and Weinstein, I. B.
Synthetic RNA-dependent DNA polymerase activity in normal rat liver and in rat hepatomas. *Nature* **237**:499-503, 1972.
- Weinstein, I. B.; and Fink, L. M.
Methods for studying mammalian transfer RNAs. In: *Methods in Cancer Research*, Vol. 6, Chapter VII, pp. 311-343, Busch, H., ed., Academic Press Inc., New York, N. Y., 1972.
- Weinstein, I. B.; and Grunberger, D.
RNA as the target of reactive forms of chemical carcinogens. Proc. of Xth Int'l. Cancer Cong. Houston, Texas. In: *Oncology*, Vol. 1, pp. 47-57, Year Book Medical Publishers, Inc., Chicago, Illinois, 1972.
- Weinstein, I. B.; and Hirschberg, E.
Mode of action of Miracil D. Research Symposium on Complexes of Biologically Active Substances with Nucleic Acids and their Mode of Action. Walter Reed Army Institute of Research, Washington, D. C. In: *Progress in Molecular and Subcellular Biology*, Vol. 2, F. Hahn, ed., Springer Verlag, Berlin-Heidelberg-New York, 1972.
- Yu, F. L.; and Feigelson, P.
Cortisone stimulation of nuclear RNA polymerase activity, *Proc. Natl. Acad. Sci. USA* **68**:2177, 1971.
Studies on the role of ammonium sulfate in nuclear transcription *in vitro*. *Biochim. Biophys. Acta* **272**:119, 1972.
On the rapid turnover of rat liver nucleolar RNA polymerase and its messenger RNA. *Proc. Natl. Acad. Sci. USA* **69**:2833, 1972.

Institute of Comparative Medicine

ROSS M. GREY, D.V.M.

Curator of Animal Husbandry and Chairman of Institute of Comparative Medicine

The department provided the central animal care facilities for 107 investigating teams which involved the animal husbandry and veterinary care for 44,221 animals of 21 species. Consulting services were provided to investigators of the Medical Center including those at Delafield Hospital, Psychiatric Institute and the Eye Institute. Veterinary consultation was also provided to St. Luke's Hospital and Brookdale Medical Center both Columbia affiliates.

The Laboratory Animal Welfare Act of 1970 (Public Law 91-579) became effective 24 December 1971 and since the facility had complied with the original Laboratory Animal Welfare Law, no upgrading was necessary and monthly inspections by the United States Department of Agriculture inspectors revealed no deficiencies reported.

In cooperation with Dr. John Budinger, pathologist for Lawrence Hospital and consulting pathologist for the Bronx Zoo, the department conducted a graduate elective seminar in comparative pathology for the Department of Pathology. Outside lecturers for this series were Dr. William Hardy, Sloan-Kettering Institute, on feline leukemias and Dr. Wayne King, Curator of Reptiles for the Bronx Zoo. The seminar discusses common biological disease processes in humans and animals and presents natu-

rally occurring animal diseases which serve as models for the study of human diseases. Zoonoses were discussed and field trips were made to the Bronx Zoo and ASPCA Veterinary Hospital.

A shorter elective Disease Review seminar was also given for the Department of Pathology. This seminar introduces the student to laboratory animal medicine and animal models for biomedical research.

The chairman continued on the advisory council for the Animal Science Department of the State University Agricultural and Technical School at Delhi, New York, as treasurer of the New York Society for Medical Research, and served as a consultant on a National Institutes of Health contract given to the University of California, San Francisco Medical Center to develop a training program for entry-level animal technicians.

Dr. Domenico Agostino, formerly in the laboratory animal section at Sloan-Kettering Institute joined the department as assistant veterinarian.

The chairman was on sabbatical leave from June to December and studied veterinary pathology with particular reference being given to laboratory animals at the Department of Pathology, Veterinary School, University of Munich.

Institute of Human Nutrition

MYRON WINICK, *Director*

Teaching and Changes in the Staff

Dr. Myron Winick was appointed Professor of Pediatrics and Director of the Institute of Human Nutrition January 1, 1972, upon the retirement of Dr. William H. Sebrell, Jr., who was the director since the founding of the Institute in 1958. Dr. Theodore B. Van Itallie, Professor of Medicine, continues as Associate Director. Dr. Jo Anne Brasel was appointed Associate Professor of Pediatrics and Assistant Director of the Institute. Dr. Sebrell became Robert R. Williams Professor Emeritus of Public Health Nutrition and special lecturer.

The Division of Growth and Development is under the direction of Dr. Jo Anne Brasel with the following medical faculty members participating: Drs. Rawle McIntosh, Thomas W. Patrick, Jr., Pedro Rosso, Myron Winick and Robert W. Winters.

The Division of Nutrition and Metabolism is under the direction of Dr. Theodore B. Van Itallie. Participants at St. Luke's Hospital nutrition unit are: Drs. Sami A. Hashim (in charge), Robert S. Bernstein, Susanne Bennett-Clark, F. Xavier Pi-Sunyer and Phienvit Tantibhedhangkul. Participants at the Columbia-Presbyterian Medical Center are Drs. DeWitt S. Goodman, Richard S. Rivlin, Frank Smith and John Smith.

The newly formed Division of Community Nutrition as yet has no director. Faculty participants are: Drs. Elinor Downs, Michael Katz, Mary McCann (Teachers College), F. Xavier Pi-Sunyer,

David Rush, W. H. Sebrell, Jr., Mervin Susser, Miss Bess I. Miller and Mrs. Cherry Vayda.

Assistant Professor Barbara A. Underwood resigned July 1, 1972. Discontinued adjunct professorships were: G. E. Livingston, F. W. Nordsiek and Donald S. McLaren.

Honors and Professional Activities

There was wide participation by the staff at various national and international meetings during the year including the IX International Nutrition Congress in Mexico, The Annual Federation of the American Society for Experimental Biology in Atlantic City, The Annual Meeting of the National Academy of Sciences in Washington, The Annual Meeting of the Society for Pediatrics in Washington and the International Symposium on Dietary Lipids and Postnatal Development in Milan, Italy.

Dr. Winick became the editor of the new annual book series *Current Concepts in Nutrition*; Volume I, *Nutrition and Development* was released in November. He was elected to the editorial board of the *Journal of Nutrition*, continues as a member of the Editorial Board of *Nutrition Reviews*; the Subcommittee on Nutrition, Brain Development and Behavior; the Committee on Maternal Nutrition of the National Academy of Sciences, and the Nutrition Study Section of National Institutes of Health. He is Chairman of the Membership Committee of the American Society of Clinical Nutrition.

Dr. Brasel became a member of the American Institute of Nutrition and the American Society of Clinical Nutrition and was elected to the newly formed Lawson Wilkins Pediatric Endocrine Society.

Dr. Van Itallie continued to serve as a member of the Food and Nutrition Board, National Academy of Sciences; the Council on Foods and Nutrition of the American Medical Association, and the Gastroenterology and Nutrition Training Committee of NIAMD.

Dr. S. A. Hashim completed four years of service as a member of the Nutrition Study Section of National Institutes of Health and was an invited speaker at the Annual Meeting of the American Heart Association.

Dr. R. S. Bernstein was elected to membership in the Endocrine Society.

Dr. F. X. Pi-Sunyer was elected Vice President of the Clinical Society of the New York Diabetes Association; he was an invited speaker at the International Congress on Nutrition in Mexico and served as consultant to the American Public Health Association's Committee on Nutritional Assessment.

Major Changes in the Curriculum

In autumn 1972 the curriculum was totally revised by the introduction of a broad program of instruction built around three divisions: Growth and Development, Nutrition and Metabolism, and Community Nutrition. Each division conducts its own research and offers its own program of instruction. The divisions are correlated with each other in order to achieve research in all areas of human nutrition and conduct an integrated teaching program in the areas of nutrition relevant to the physician and medical scientist. The food science and technology courses were discontinued.

The Master of Science degree in human nutrition is offered through the Faculty of Medicine and consists of two semesters of academic work in the three divisions of the Institute and the completion of a three months project or its equivalent. There are eleven candidates in the current program.

The Ph.D. in nutrition is given through the Graduate School of Arts and Sciences under the Doctoral Program Subcommittee on Nutrition. The steering committee responsible for the program consists of Professors Myron Winick, Theodore B. Van Itallie, James E. Darnell, Jr. (biological sciences), Max Eisenberg (biochemistry) and one member yet to be appointed. There are seven students in the current doctoral program.

The postdoctoral training program constitutes an

active part of the Institute's program with a total of twelve fellows serving both at the College of Physicians and Surgeons and at St. Luke's Hospital Center. The joint seminar conducted each week is an integral part of the postdoctoral teaching and research training program of the Institute.

Educational Programs

In addition to the academic program, a series of autumn lectures were given at the Institute by international nutrition scientists who were participants at the IX International Congress on Nutrition in Mexico. These lectures were open to other graduate students of the University as well as faculty and hospital personnel.

The Symposium on Nutrition and Fetal Development, attended by approximately 1000 persons, was presented by the Institute and sponsored by the National Foundation-March of Dimes on November 13-14 in New York City with outstanding investigators from several countries participating. The purpose of the symposium was to generate new ideas and new methods for carrying out research and practical new programs of reducing the effects of maternal undernutrition on fetal development. The Institute plans to present similar symposiums each year.

Research

Research projects conducted in the Division of Growth and Development during the past year have included studies on nutrition as it relates to the mechanism of cellular growth, central nervous system development, prenatal growth, infection and drug metabolism. Additionally, biochemical indices of normal growth and nutritional status during development have been investigated.

Dr. Van Itallie in association with Dr. David Quartermain (New York University School of Medicine) has studied hunger drive during starvation in rats whose depot fat has been enriched by diet with odd-chain fatty acids, notably undecanoate.

Research conducted by the Division of Nutrition and Metabolism at St. Luke's Hospital includes a number of studies on lipid metabolism both in animals and man as well as studies relating to diabetes and other metabolic diseases. Studies in man on appetite control using a special feeding machine are continuing.

Additional research at the Columbia-Presbyterian Medical Center involves investigations of vitamin A, vitamin D, riboflavin and cholesterol in health and disease. (For names of investigators and pub-

lications consult the bibliography of the Department of Medicine.)

The Division of Community Nutrition has begun research in the areas of maternal nutrition and fetal growth; nutrition, environmental enrichment and subsequent development; and growth of previously malnourished children. Projects under development for further investigation include a survey of nutritional status of a poor urban community, community nutrition education, and nutrition of the elderly.

Foundation for further research in the Central Harlem-Washington Heights neighborhoods is being laid by Bess I. Miller, public health nutritionist, by conducting a course for community health workers, assisting in forming weight control groups in two elementary schools and providing resource and evaluation services to the Columbia University Day Care Projects. Nutrition projects for adolescents in

the junior high and senior high schools are planned for the spring term with the aim that eventually nutrition courses will be added to the schools' curricula.

Donors

Major donors to the Institute during the past year were:

Agency of International Development, Campbell Institute for Food Research, Coca Cola Company, Gerber Food Company, H. J. Heinz Company, General Foods Fund, General Mills Foundation, Grant Foundation, National Dairy Council, National Foundation, National Institutes of Health, Norman Jolliffe Fellowship Fund, Nutrition Foundation, Research Corporation, Ross Laboratories, St. Luke's Hospital Fellowship Fund, WHO Pan American Health Organization.

1972 Publications

Institute of Human Nutrition

Bernstein, R. S.; Grant, N.; Crespin, S. and Kipnis, D. M.

Altered fat cell metabolism in endogenous hypertriglyceridemia. *Clin. Res.* 20:541, 1972 (abstract).

Brasel, J. A.

Age dependent differences in DNA polymerase activity following uninephrectomy in rats. *Growth* 36:45-58, 1972.

Brasel, J. A. and Winick, M.

Maternal nutrition and prenatal growth. *Arch. Dis. Child.* 47:479-485.

Brodows, R. G.; Pi-Sunyer, F. X.; Schalch, D. S. and Campbell, R. G.

Neural control of the metabolic and hormonal responses to glucogenic stress in man. *J. Clin. Invest.* 51:15a, 1972.

Ho, C. K. and Hashim, S. A.

Pyridine nucleotide depletion in pancreatic islets associated with streptozotocin-induced diabetes. *Diabetes* 21:789-793, 1972.

Campbell, R. G. and Hashim, S. A.

Odd chain fatty acid-enriched rat: model for study of depot fatty-acid incorporation and turnover. *Proc. Soc. Exper. Biol. Med.* 141:652-655, 1972.

Pi-Sunyer, F. X.

Effect of fatty acids on insulin secretion from pieces of pancreas incubated *in vitro*. *Clin. Res.* 20:553, 1972 (abstract).

Reduction of starvation-induced detosis in dogs enriched with odd-carbon fatty acids. *Amer. J. Clin. Nutr.* 25:454, 1972 (abstract).

Pi-Sunyer, F. X. and Cushman, P., Jr.

Sheehan's syndrome and diabetes mellitus: observations on the Houssay phenomenon in man. *Amer. J. Med. Sci.* 264:143-147, 1972.

Pi-Sunyer, F. X.; Hashim, S. A.; Campbell, R. G. and Van Itallie, T. B.

Metabolic studies in animals enriched with odd-carbon fatty acids. *Summaria: IX International Nutrition Congress*, p. 108, September 1972 (abstract).

Pi-Sunyer, F. X. and Sethi, S. S.

Stimulation of insulin secretion by sodium beta-hydroxybutyrate in man. *Diabetes* 21:Suppl. 1, 373, 1972 (abstract).

Pi-Sunyer, F. X. and Van Itallie, T. B.

Impaired glucose tolerance and insulin hyperresponsiveness associated with chronic glucagon administration. *Diabetes* 21: Suppl. 1, p. 374, 1972 (abstract).

Rosensweig, N. S. and Pi-Sunyer, F. X.

Functional bowel disease and reactive hypoglycemia. *Clin. Res.* 20:464, 1972 (abstract).

Saleh, J. W. and Hashim, S. A.

Sedimentation behavior of platelets in plasma from patients with hyperlipoproteinemia. *J. Clin. Invest.* 51:84a, 1972 (abstract).

Sebrell, W. H., Jr.

Chemical aspects of updating diet quality. *Ag. and Food Chem.* 20:518-522, 1972.

Sebrell, W. H., Jr.; King, K. W.; Webb, R. E.;

Daza, C. H.; Alvarez-Franco, R.; Smith, S. C.;

Severinghaus, E. L.; Pi-Sunyer, F. X.;

Underwood, B. A. et al.

Nutritional status of middle and low income groups in the Dominican Republic. *Arch. Latino Americano de Nutricion* 22: numero especial (190 pp.) 1972.

Shah, S. I.; Alderman, M.; Queenan, J. T.; Brasel, J. A. and Winick, M.

Nondialyzable peptide-bound hydroxyproline in human amniotic fluid: An indicator of fetal growth. *Am. J. Obstet. Gynecol.* **114**:250-254, 1972.

Tantibhedhyangkul, P. and Hashim, S. A.

Metabolic fate of intravenously administered tri-octanoin and octanoic acid. *J. Clin. Invest.* **51**:96a, 1972 (abstract).

Winick, M.

Nutrition and the growing fetus. *Medical World News: Obstet. and Gynec.*, pp. 47 and 49, 1972.

Nutrition, development and the physician's responsibility. *Pediatric Basics* (Gerber Products Co.) No. 5, pp. 10-12, 1972.

Neurological correlations of malnutrition in animals and man. In: *Nutrition, Growth and Development of Native American Children*. W. M. Moore, M. M. Silverberg and M. S. Read, eds. Washington, D.C. Govt. Printing Office, 1972.

Winick, M.; Brasel, J. A. and Rosso, P.

Nutrition and cell growth. In: *Concepts of Nutrition: Nutrition and Development*, Vol. I. Myron Winick, ed. John Wiley, New York, 1972.

Winick, M. and Coombs, John

Nutrition, environment and behavioral development. *Ann. Rev. Med.* **23**:149-160, 1972.

Winick, M. and Rosso, P.

Malnutrition and brain development. In: *Pediatrics*, Vol. I. J. Meneghello, ed., Inter-Medica, Buenos Aires, 1972.

Winick, M.; Rosso, P. and Brasel, J. A.

Malnutrition and cellular growth in the brain. In: *Biblio. Nutr. et Dieta*, No. 17. J. C. Somogyi, ed. S. Karger, Basel, 1972.

Malnutrition and cellular growth in the brain: existence of critical periods. In: *Ciba and Nestle Foundations' Joint Symposium on Lipids and Developing Brain*, London, 1971 (Proceedings) Associated Scientific Publications, Amsterdam, 1972.

Medical Library

THOMAS P. FLEMING

Professor of Library Service

The Medical Library's collection continues to grow, but because of the impact of budgetary limitations, the growth for this year is less than in previous years. Seventy-seven subscriptions were dropped. Funds saved from this process allowed us to meet some of the rising costs of periodicals and their binding. 5716 volumes were added to the collection and 3471 volumes were withdrawn, in keeping with our continuous weeding program, thus making the net gain of only 2245 volumes. The total collection presently numbers 317,972 bound volumes. 4328 serials are received currently in the Library. This figure represents subscriptions and titles received via gift and/or exchange. Despite this cutback in the growth of the collection, the Library has continued to acquire material to meet the wide range demands of its clientele.

No library can ever hope to have in its collection all the material called for by its users. This year 906 volumes were borrowed from other libraries, principally from the New York Academy of Medicine, the National Library of Medicine, the Medical Research Library of Brooklyn and the Medical Library Center of New York. 339 volumes were borrowed from other Columbia libraries. Our loans to other libraries still far exceed the number borrowed, 3571 volumes were loaned (622 xerox requests). This figure shows a drop of almost 400 from the number of volumes loaned out last year. This is due partially to the existence of the Regional Medical Library and partly because we try not to lend material housed in our annexes to other

libraries, if we know it is available elsewhere in the area. 328 libraries throughout the United States and in Canada, England, Spain, Israel, Italy, Germany, Japan, and Sweden were the recipients of loans from this library. 314 volumes were loaned to other Columbia libraries.

54,202 volumes were loaned for a two-week period and 10,144 volumes were loaned for a two-hour and/or overnight loan. An estimated 111,614 volumes were used in the Library and our estimated attendance for the year was 107,749 persons. (The Library does not have a truly reliable figure for use in library or attendance. In our opinion these figures would be higher if accurate counts were taken.)

The Library's Bibliographic Service inaugurated in 1939 continued to serve the clientele. This year 14,689 citations were supplied to subscribers (an increase of almost 4000 over last year's figure). Forty MEDLARS Demand Searches were submitted to the MEDLARS Center of the Regional Medical Library located at the New York Academy of Medicine.

Dr. S. William Rosenberg in his article, "Who's Out of Date?" appearing in the April 15, 1971, *New England Journal of Medicine*, p. 850-851 stresses the need for training the student to utilize the library and its resources. The Medical Library each year attempts to increase its teaching function. In 1971/72 formal lectures (1 hour or more) were given by various staff members to the students in Nursing, Occupational Therapy, Physical Thera-

oy, Postgraduate Dentistry, Dental Hygiene, School of Public Health, and Registered Nurses and Practical Nurses in an advanced course in operating room technology. In several of the lectures, the Reference Staff experimented with the use of slides and an opaque projector to illustrate the various reference tools being described. The Reference staff is preparing a recommendation on the utilization of more multimedia equipment for lectures. Over and above the aforementioned lectures, scheduled tours of the Library were given to various groups of students and staff. Informal introductory tours are given throughout the year to anyone new to the Library who expresses a desire for such a tour. We have also advertised that on Wednesday afternoon at 1:30, the Library staff is ready and willing to conduct tours of the Library. We have had some response to the Wednesday tours. The first-year medical students and the first year dental students are the two groups which seem not to schedule any type of orientation to the Library. Past efforts have failed to produce results, but we will take more aggressive steps this coming year to remedy the situation.

Forty-six students enrolled in the special graduate courses in medical and science librarianship given by Professor Fleming at the Medical Center under the auspices of the School of Library Service, used the Medical Library as their laboratory. Visitors to the Library included librarians from Hong Kong, England, and Thailand.

Exhibits in the Library this year included the following: "MEDLARS—Important Reference Tools"; "Great Men of Padua"; "Some Landmarks in Plastic Surgery" (with the cooperation of the Webster Library); "Fifty Years of the Index to Dental Literature"; "Conquest of Yellow Fever."

When the editorship of the *Journal of Clinical Investigation* moved from P&S, the Library's responsibility for verifying the bibliographic citations included in all articles accepted for publication in the *Journal of Clinical Investigation* ended. This task was quite a time-consuming one for the Reference staff and this time can now be utilized for the performance of more professional duties.

Dr. Jerome P. Webster continued his generous support of the Jerome P. Webster Library of Plastic Surgery. In addition the Library was the recipient of 29,641 gift monographs and serials, an increase of over two thousand from last year's figure. As always, we are grateful to the faculty, alumni and other friends, the names of whom are too numerous to mention here, for their generosity. Several of the subscriptions the Library cancelled

were second copies of heavily used journals. These gifts enable us to continue to maintain second copies of certain titles without using library funds.

Through the generosity of an anonymous donor, second year-second semester and third and fourth year medical students are being subsidized for xeroxing—\$7.50 per student for the second year-second semester students and \$15 per student for the third and fourth year students.

175 monographs and 4294 serials were sent to the Medical Library Center, representing items withdrawn from the collection and/or material received via gifts which the Library feels should be available in the area, but not used enough by its clientele to warrant giving up valuable shelf space to house them here. The Medical Library Center of New York continued its valuable pick up and delivery service. It issued a new edition of the *Union Catalog of Medical Periodicals*. As noted previously, this tool is used for interlibrary loan purposes and also for acquisitions purposes.

Administrative direction was given to the other libraries comprising the Medical Sciences Division, namely, the Jerome P. Webster Library of Plastic Surgery; the Neurological Institute Library; the Library of the Francis Delafield Hospital and the Columbia University Institute of Cancer Research; the Library of the Division of Program Development and Evaluation of the International Institute for the Study of Human Reproduction; and the Dr. Louis T. Wright Memorial Library of the Harlem Hospital Center. These libraries are associated with the Faculty of Medicine, but not funded by the University Libraries. All of these libraries were plagued by lack of funds this past year. The Delafield Library assists its clientele with a modified SDI service. The Neurological Institute Library is participating in the Epilepsy Abstract Retrieval System experimental project sponsored by the National Institute of Neurological Diseases and Stroke. This on-line retrieval system is available to the Neurological Institute staff twice a week. The Institute for the Study of Human Reproduction Library moved to new quarters in the Bard Haven Apartments. It was awarded a two-year contract by AID "for the purpose of developing and producing a thesaurus of terms for information storage and retrieval in family planning program development and evaluation, and a bibliography in the field." Despite numerous problems with the Health and Hospital Corporation, the Harlem Hospital Library has continued to grow and make progress toward meeting the needs of its clientele.

The following appointments were made: Karen

Hall, formerly Reference Librarian in the Medical Library was named Head, Medical Reference Section. Charles L. King, Ph.D., Reference Librarian, resigned to accept the position of Head of Readers Services at the Dr. Louis T. Wright Memorial Library of the Harlem Hospital Center.

Professor Thomas P. Fleming, Head, Medical Sciences Division, retired on August 31, 1972, after thirty-five years of service with the Columbia University Libraries. To date no successor has been named. His contributions to medical librarianship are legion. At the Medical Library Association's Annual Banquet in San Diego, the Association honored Professor Fleming by awarding him the Marcia C. Noyes Award, the highest honor the Association can accord one of its members. On May 9, 1972, a dinner honoring Professor Fleming was held in the Low Rotunda. Among the gifts presented was a portrait of Professor Fleming which hangs in the Main Reading Room of the present library and which will hang in the new library when that edifice becomes a reality. A book fund for the Medical Library was established in his honor. Professor Fleming will be missed at the Library, but will long be remembered for his untiring efforts to maintain the high quality of the Columbia University Medical Library.

Staff members continued to be active in professional organizations. Thomas P. Fleming is a member of the University Seminar on the Renaissance and the University Seminar on Death. He continued as a member of the Sub-Committee on Orthopedic Information, National Research Council.

Cecile E. Kramer, Assistant Medical Librarian, continued as Secretary of the Ad Hoc Committee to Review the Goals and Structure of the Medical Library Association. She also continued as a member of the By-Laws Committee, New York Regional Group, Medical Library Association. Miss Kramer was elected Vice Chairman, Chairman Elect of the New York Regional Group, Medical Library Association. She continued as Columbia's representative to the Advisory Committee of the Regional Medical Library of New York and Northern New Jersey. Miss Kramer replaced Professor Fleming on the Task Force on Acquisitions of the Associated Medical Schools of New York and New Jersey. She taught the Continuing Education course in "Human Factors in Medical Library Administration" at the Medical Library Association's Annual Meeting in San Diego, June 12, 1972. Miss Kramer

also taught the course in New York as part of the New York Regional Group's Continuing Education Program.

Dr. Charles King, Reference Librarian, was a member of the Program Committee, New York Regional Group, Medical Library Association. All members of the Reference Section took part in the METRO-CUNY Mutual Benefit Instruction Network seminars.

The 40,000 volumes removed from the Prentiss building (Basic Sciences prior 1920, Clinical Sciences prior 1930) and relocated in stack space in the new School of International Affairs Library were unpacked and are now available to our clientele via our daily messenger service to the campus. We are still in the process of transferring more material to annex space in the aforementioned Library.

Progress has been made on the plans for the new library. The Library Building Committee established by the Dean has been meeting with the architect and discussions have proved very valuable. Each year we reiterate the Library's great need for new quarters. Hopefully, plans will go forward at a rapid pace so that the new library will be near completion in 1976.

Despite the various difficulties which the Library encountered during the year, it can be proud of its accomplishments and its service to the clientele served. The heart and core of librarianship is to bring together the reader and the information he seeks. Whether we do this manually, via a computer, or with the utilization of other advanced technology, it is this librarian-reader relationship which brings the greatest satisfaction. The Medical Library staff is dedicated to this principle, and this dedication has enabled them to bring the highest quality of service to its users under most trying conditions.

1972 Publications

Medical Library

Dao, T. L., King, C. L., and Tominaga, T.

Isolation, identification and biological study of compounds derived from 3-methylcholanthrene by irradiation in dimethyl sulfoxide. *Cancer Research* **31** 1492-1495, 1971.

Center for Community Health Systems

JOHN H. BRYANT, *Director*

Background and Purposes

The Center for Community Health Systems is an interdisciplinary, interdepartmental project of the Columbia University Faculty of Medicine that came into existence January 1, 1972.

It is useful to review the thinking in the Faculty of Medicine that led to the establishment of the Center. It began with the realization that the problems of health care delivery are exceedingly complex. Large communities of people living within a tangled network of social, political, economic and environmental forces are afflicted with or threatened by a variety of diseases. The health care system — complex, fragmented, costly, and of limited effectiveness — meets some of the needs of the population, falling far short of others. The primary strengths of the University lie in the areas of research and education; its approach to providing care has usually been through affiliations with institutions or agencies that have the actual responsibility for health care. These issues led to the following series of conclusions:

First, the Faculty of Medicine's efforts in the area of health care systems should be aimed at developing a capability for analyzing health care problems, designing changes in health care systems, participating in the implementation and the evaluation of those changes. This capability should be available in carefully selected instances as a resource to those primarily responsible for health care de-

livery, such as our affiliated hospitals (Presbyterian Hospital, Roosevelt Hospital, St. Luke's Hospital, Harlem Hospital Center, Francis Delafield Hospital, and the Mary Imogene Bassett Hospital in Coopers-town), community-based programs, and the agencies responsible for health care in the City and State of New York. In other words, the emphasis should be on serving as a research and development resource to the health care providers and communities rather than on the University assuming direct responsibility for providing health care.

Second, the nature and complexity of the problems call for concerted action by a variety of disciplines, many of which are not currently represented in the Division of Health Sciences of the University. The need for an interdisciplinary group to work together on these problems is clear. Further, the need is not for individuals of different disciplines clustered together each working on his own problem, but for individuals to work together on problems of common interest, each bringing to the others the insights of his particular discipline.

Third, this capability should not be located in a single department or school, but should be structured in our institution so as to involve all relevant departments. The point here is to open the two-way street bringing the strengths of those departments to this new effort and also bringing to them the important unanswered questions of health care which should claim their interest.

Thus, the Center was established as an interdis-

ciplinary, interdepartmental project of the Faculty of Medicine.

It is appropriate to point out that this series of decisions represents a substantial departure from traditional University modes of function. Generally speaking the response of universities to major societal problems has taken the form of individual or groups of faculty members shaping their own approach to the problems, functioning within a permissive or supportive university framework. Here, in contrast, there have been decisions by the institution that there should be an institutional commitment to this set of societal problems, and that the effort should be cast in the institutional structure so as to provide the strongest possible links with the research and educational potential of the institution. This is one of the most interesting and perhaps the most important aspects of this new development in our University.

The purpose of the Center in the broadest sense is seen as contributing to improvements in health care, particularly in Upper Manhattan, the area served by our University hospitals. This local focus is chosen both because of our feeling of responsibility to the communities of that part of New York City and because of the importance of the problems of urban health care in general. At the same time, this will not be our exclusive focus. Our longstanding affiliation with the Mary Imogene Bassett Hospital in Cooperstown, New York, presents the opportunity to look at health care problems in a rural area and provides instructive comparisons with the inner city setting.

Executive Committee and Staff

In the administrative structure of the Faculty of Medicine, the Center for Community Health Systems is attached to the Office of Vice President for Health Affairs. The Center has an Executive Committee, chaired by Dr. George Lythcott, Associate Dean for Community and Urban Health Affairs, and includes Dr. Paul Marks, Vice President for Health Affairs, the chairmen of the major clinical departments, representatives from the School of Public Health and from the main campus, including Dr. Eli Ginzberg, Dr. Mitchell Ginsberg, Dean of the School of Social Work, and Dr. Cyrus Levinthal, the Biologist. The administrators (or their designates) of our six University hospitals serve on this Committee, as do representatives of the Health Services Administration and the Health and Hospitals Corporation.

The Executive Committee meets every two months to review and advise on the activities and

plans of the Center. The Center staff, in turn, uses members of the Executive Committee on an *ad hoc* basis for guidance on particular issues.

The Center staff is both interdisciplinary and interdepartmental. The majority hold appointments in one of the departments of the University and devote varying amounts of time to work in the Center. Others work fulltime in the Center. The Director of the Center, Dr. John Bryant, also the Director of the School of Public Health, is interested in health care and the education of health personnel in both less developed and more developed countries. Dr. Allen Ginsberg, Deputy Director of the Center and Associate Professor of Public Health, holds his Ph.D. in Operations Research and Systems Analysis and has been working on problems of health care delivery and clinical patient management for a number of years. Other Faculty members of the School of Public Health who devote a majority of their effort to the Center include: Professor Nora Piore, Associate Director of the Center, a nationally known contributor to the field of health economics, was most recently scholar-in-residence at the Association for Aid to Crippled Children; Professor Regina Loewenstein, Area Director for Statistical Studies in the Center, has made many valuable contributions to the health care field. Dr. Lloyd Novick, a physician with training in public health, was most recently New York City Health Officer for Washington Heights and Central Harlem. Miss Sheila Gorman, a nurse with an M.P.H., has had substantial experience in health services research in New York City. Mrs. Susan Cohen has background in anthropology and sociomedical sciences.

Faculty members from the School of Public Health who devote a smaller portion of their time to the Center include: Dr. Lowell Bellin, the Director of the Division of Health Administration in the School of Public Health, who recently served as First Deputy Health Commissioner for New York City. Dr. Seth Goldsmith, the School's Director of the Graduate Program in Health Services Administration studies, earned his doctorate in medicine at Johns Hopkins, and came to us from the faculty of Tulane University.

The interdepartmental nature of the Center is reflected in the participation of a variety of individuals. Dr. Russell Asnes, Director of the Pediatric Ambulatory Care Unit at Presbyterian Hospital, devoting part of his time to the Center bringing strong interest in improving health care delivery for children. Dr. Harold Applewhite, a member of the School of Dentistry's Department of Communi-

Health, will add to Center projects an expertise in mental health care. Professor Nathan Lefkowitz of Teachers College and the School of Public Health, is a sociologist with innovative approaches to consumer health education. Professor Herbert Lukashok, whose primary appointment is in the Department of Community Medicine at Albert Einstein College of Medicine, is the Center's Project Director in its participation in the long-range planning at the Mary Imogene Bassett Hospital in Coopers-town, New York. Dr. Victor Schulman, a pediatrician with a graduate degree in biostatistics, is working on the Child Health Care Project.

Other members of the Center staff include: Dr. Brant Fries, a post-doctoral fellow of the Center, recently earned his Ph.D. in Operations Research at Cornell University; Dr. Robert Bloom, with a Ph.D. in Education from Ohio State University, has a strong interest in task analysis of health personnel and in curriculum development. Mrs. Shu-Ping Lan, with a Master's degree in sociology, is a Research Assistant in the Center. Harold Cohen is a cost analyst, and Mary Kane is a computer programmer who serves as a liaison between the Center and the Columbia University Computer Center on the Downtown Campus.

The Center's relationships with communities have been facilitated by Margaret Haynes, Judy Wicks, and Natalie Becker, functioning in close association with Dr. Lythcott's Office of Community and Urban Health Affairs.

Graduate students who have given valuable assistance to a number of Center projects include: Constantinos Xanthopoulos from the School of Architecture, and Ronald Podell and Margaret Young from the Medical School, and doctoral students in the Department of Operations Research. Arthur Gober, Research Assistant in the Center, is working on his doctoral degree in Operations Research at Columbia.

Internally, the Center is organized according to Projects and Areas. Each project has a director who draws from the interdisciplinary staff the persons needed to pursue the project. Certain subject matter areas, such as statistical studies, health economics, community interaction, and sociomedical studies, have directors and staff. There is flexibility in the use of staff — an individual may be a director of one project and a working member of another.

Projects of the Center

The Center has recognized the importance of focusing its efforts on a limited number of projects. The concept guiding the choice of projects is that

the problems under consideration should be important in terms of health care as an overall system and also have applicability beyond the immediate setting of the project. Community concern for health problem areas has also been a criterion of selection. The following projects are in the planning phase, or are under way

Study of the Use of Emergency Services

For the purposes of this study, "*emergency services*" are defined as those components of the health care system that are designed to meet demands for unscheduled or episodic primary care. The objectives of the study are to identify and classify problem related to the provision of emergency services and to develop an empirical base for designing, implementing and testing possible alternatives as well as for improving current procedures. Since early results confirmed that the problems besetting emergency services are inseparable from the more general issue of the role of the hospital in providing primary care, this study will also examine emergency services as they affect and are affected by services for primary, secondary, tertiary and preventive care both within and outside the hospitals.

Mushrooming use of hospital emergency rooms for other than true emergencies is a nation-wide problem requiring analysis and change. The hospitals affiliated with Columbia University are also faced with this problem, the number of emergency room visits having risen dramatically in the last 10-15 years. The Center, in cooperation with these hospitals, has undertaken to study and to consider possible solutions to the problems generated by this massive upsurge in the use of emergency services.

The first phase of this study focused upon two major objectives: understanding the actual operations of the emergency services at the five Columbia-affiliated hospitals; and defining the major problems facing these services. The study team visited each hospital and spent considerable time observing how the services function, reviewing written material and discussing with administrators and staff what they consider their problems to be. In addition, a sample of 400-500 records of unscheduled patient visits to each hospital was drawn and information on each visit abstracted (including sociodemographic characteristics, source of payment, complaint, diagnosis, tests, treatments, and disposition). Both sets of data will serve as input to the proposed second phase of this study.

Many of the problems facing emergency services have a common source — the use of a facility designed to care for emergent, life-threatening condi-

tions by patients seeking primary, episodic medical care. This basic mismatch between organization and consumer has numerous consequences, all of which have led in turn to a reduced effectiveness in the delivery of services and to a lessened quality in the care given non-emergencies as well as true emergencies. The second phase of the study will approach possible changes in the arrangements for providing these services by way of a series of studies aimed at achieving a better understanding of consumer behavior, a better methodology for determining and controlling the true costs of emergency and other primary care services by hospitals, new methods for easing and rationalizing patient entry into the health system so that there can be a better mesh of patient needs and goals with institutional resources and goals; new methods for linking emergency care to other components of the health care system; new and more efficient patterns of utilizing staff and technology; improvement in administrative structures and functions, including the development of new information systems, methods of controlling patient flow, etc.; and new methods for delivering episodic primary care.

Effective working relationships with the emergency service staffs at the five hospitals have been established. Community groups are involved in reviewing progress to date and in planning future steps in the study.

Child Health Care Project

The Center and the Department of Pediatrics of the Faculty of Medicine have undertaken the planning phase of a major project aimed at developing a health service network for children in Upper Manhattan. Generally speaking, existing health services for children are fragmented, uncoordinated, costly, inaccessible, impersonal and non-comprehensive.

The general goal of this project is to enlist the resources and leadership of the hospitals in this area in an effort to weave presently fragmented services into a more rational fabric for coordinating and upgrading services outside of as well as within institutions.

The project will approach the problems of child care at three levels. At one level will be the effort to improve the ways in which care is provided for the children who come to the hospital ambulatory care clinics for care, including the increasingly large number who seek primary care. At the second level is the concern that the hospital-based pediatric units are integrated with and supportive of a rationally developed and interrelated local child health care

network including community-based physicians, school health programs, child health care stations, and so forth. The third level is concerned with the larger network of services in Upper Manhattan, particularly with the ways in which some problems, such as behavioural and learning disorders, might be approached collectively, and with how the complex pluralism of health services serving a large urban population might be constructively influenced.

Community groups, schools, the Health Department, and the directors of pediatric ambulatory care at Roosevelt, St. Luke's, Harlem, and Presbyterian Hospitals have participated in early planning discussions.

While substantial progress has been made over the years to expand and coordinate child health services in the City, these efforts have also added to the complexity of the health care arrangements. The totality of child health services remains short of the goal of effective organization and deployment of services and resources. What is unique about the current undertaking under the leadership of the Center and the Department of Pediatrics is that it enlists and engages several major hospital providers of child health services in the effort to improve services both outside of and inside institutions.

Hospital Cost Control and Peer Review

The Social Security Administration, with its responsibility for Medicare, has asked the Center to accept a project of major importance originated by Dr. Bellin under the auspices of the New York City Health Department. The principal concerns of the project are control of utilization and costs in short-stay hospitals and the development of methods for peer review of health services. The project will involve identifying and systematizing those factors necessary to improve utilization of short-stay hospital beds, to match length of patient-stay to patient need, to establish and maintain reasonable costs for hospital care, and to develop methods to monitor such costs. Eight to ten hospitals in New York City will be studied as models. The specific objectives include: determination of the validity of the Social Security Administration's MADOC (Medicare Analysis Days of Care) System as a data base for utilization and cost control programs; and development of methods to analyze data from individual hospitals, analyze hospital managerial structures, review medical records, and study patterns of physician practices. The methods, in turn, will produce data systems and management procedures, cost analysis procedures, cost control activities, and appropriate discriminants to serve as a base for professional

service review organization (PSRO) and third party review evaluation.

Mary Imogene Bassett Hospital Planning Project

The Center is about to embark upon a planning project with the Mary Imogene Bassett Hospital (MIBH) in Cooperstown, in rural upstate New York. The precipitating problem which resulted in the clear perception by the MIBH of the need for a planning program is the increasing pressure upon the Hospital for primary care services. The essential issue is not unlike that which is facing teaching hospitals and medical schools in the urban areas; namely, what should be the role of the hospital in the delivery of primary care services to the community? This question must be considered, in turn, as part of another question: what should be the role of the hospital in the regional health care setting?

The Center will provide consultation services and technical assistance while the hospital develops its own long-range planning capability.

Other Projects

A cluster of potential projects are in various stages of development, including: a study explored with Dr. John Kinney on the cost-effectiveness of the care of acute traumatic emergencies; a study by Professor Piore on health services expenditures and the development of public policy; a study by Dr. Lefkowitz on "help seeking behaviour" in child health care settings; the development of a fact book — A Health Profile of Upper Manhattan — by Professor Loewenstein; and an analysis of the roles of various levels of health administrators and consideration of the implications for curriculum development by Drs. Goldsmith and Bloom.

Community Interaction

The Center recognizes that significant community participation is needed for successful approaches to the problems of health care delivery. This is true both because of the social importance of taking into account the sense of priorities of communities but also because of the practical importance of enlisting community support in identifying problems and designing and implementing health care solutions.

Within its organizational structure, the Center has a "Community Interaction Area" with staff selected in concert with communities for maintaining liaison with communities. For example, working committees of community and Center staff are currently at work on the Emergency Services Study, and discussions with communities are underway regarding the Child Health Care Project.

Educational Programs

The Center is also designed to include substantial involvement in the education and training of health personnel. Relationships are being developed with educational programs in the Division of Health Sciences so that the involvement of the Center in health care problems can provide both guidelines for curriculum development and also field placement opportunities for a variety of health personnel.

The Center's projects are currently used for tutorials in health planning and health services research for students in the School of Public Health. Graduate students in medicine, architecture, and operations research have worked in the Center on a part-time basis.

The Center provides a limited number of post-doctoral traineeships, the first being Dr. Brant Fries, who recently earned his Ph.D. in Operations Research from Cornell University.

The project of Drs. Goldsmith and Bloom mentioned above is an example of a systematic approach of the Center to the interrelationships of health services and the education of health personnel.

Funding

The primary funding of the Center is derived from a three-year grant initiated in January, 1972, from a consortium of foundations — The Commonwealth Fund, the Carnegie Foundation, and the Rockefeller Foundation. Additional funding is being sought from other sources to support individual projects of the Center.

Space

The Center is located in newly renovated space at 21 Audubon Avenue, a short distance from the Columbia-Presbyterian Medical Center.

Report of the Dean of the Faculty
of Dental and Oral Surgery

School of Dental and Oral Surgery
Columbia University in the City of New York

Report of the Dean of the Faculty of Dental and Oral Surgery

The University, realizing the need for even greater emphasis on the prevention of dental disease, revised the dental curriculum in 1969. The new curriculum is designed to increase the student's appreciation of the conceptual basis of dentistry. Adequate preparation for dentistry demands an understanding of broad biological principles integrated with the continually evolving body of scientific information in clinical dentistry and basic dental research. Building on this base, the student is exposed to the full spectrum of dental problems as a directed observer, and is then introduced to those surgical and manipulative procedures and methods of diagnosis and prevention which he must learn to perform with a high degree of competence. Emphasis is on the close relationship between systemic and oral health and disease, on systemic aberrations that affect the oral structures, on diseases of the mouth which may affect other organ systems, and on dental health as an essential to total health.

The present fourth year class is the first class to go through the entirely new curriculum. They have taken National Boards a year earlier than usual and have distinguished themselves in all phases. Most of the curriculum changes this year involve the offering of electives to fourth year students. Some of these electives (honor courses) will be considered as part of specialty training. Sixteen members of the class are taking an elective in prosthodontics in their fourth year in which advanced cases are handled and seminars are held monthly, in which the literature is researched and presentations made by the students.

Since less time has been allotted to the preclinical courses in prosthodontics, less emphasis has been placed on manipulative skills on dental models and much more on a conceptual and biologically oriented basis. A new program in complete dentures was instituted for the sophomores this past summer where the pre-clinical and clinical courses were combined. Each student under close observation completed a set of dentures for a patient in 8 weeks time.

An elective course in training in expanded duties auxiliary management (T.E.A.M) was added to the fourth year. This pilot program teaches effective management and utilization of auxiliaries trained to perform many reversible oral therapeutic functions,

heretofore restricted to the graduate dentist. The course also presents the elements of personnel management, multiple personnel and patient scheduling and supervisory functions. The clinical phase offers practical experience operating a TEAM of such auxiliaries in a large scale system of delivery of quality dental care.

The Core Clinical Course in Operative Dentistry—which includes Summer Session II, the Third Year and Summer Session III—underwent some substantial changes. The forty lectures were redesigned to reflect the conceptual basis of the practice of dentistry and updated to include the new restorative materials, modes of delivery of patient care, and the preventive technics.

A new multidisciplinary course is being offered—comprehensive review seminars—which was designed for the fourth year class and brings together the staffs of the Division of Operative Dentistry, Prosthodontics and Periodontics to discuss in an informal manner the clinical problems associated with total patient care.

In orthodontics the predoctoral core program was modified to begin lectures in Summer Session II in order to provide background material for the pre-clinical technic course given at the beginning of the third year. Also, the 4th year elective in orthodontics was expanded to allow another half-day session per week. In addition, for the first time this year, two fourth year students were accepted into an honors program in orthodontics which is equivalent to the first year of postdoctoral studies. It is anticipated that these students will be accepted with advanced standing into the postdoctoral program next year.

Adoption of the fourth year elective program in pedodontics permitted significant expansion in the predoctoral teaching. This included additional seminar activity pertaining to medico-dental relationships in handicapping conditions, and clinical training of predoctoral students in dentistry for difficult and handicapped children at our clinic and special affiliated facilities. These assignments for predoctoral students served to expand our predoctoral teaching activity and broaden the students exposure to the needs of special segments of the population.

Our teaching activity at the postdoctoral level was expanded in two significant respects. First, a regular weekly assignment to Roosevelt Hospital was added to the program as an extension of our training in including extramural affiliated hospital facilities, and second, the assignment consists of hospital operating room procedure and performance of complete dentistry under general anesthesia for special patients. Although dental service under these conditions is indicated for a small percentage of our special patients, this activity is an important addition to the training program for the specialty of pedodontics and serves to implement further the affiliation with Roosevelt Hospital.

A new elective course entitled Oral Medicine, Oral Pathology and Oral Surgery which is offered to selected fourth year students is being given for the first time during 1972-1973 scholastic year. It has proven to be an unusually valuable and highly satisfying course for those students who are particularly interested in pursuing careers in one of the above mentioned fields.

A summer session for graduate students and the M.S. degree in administration, curriculum and teaching of dental hygiene was added. Also added were three new undergraduate courses. They concerned: pain control, professionalism in dental hygiene and oral biochemistry.

The registration for the School of Dental and Oral Surgery in September of 1972 was as follows:

Predoctoral Program	184
First Year	54
Second Year	46
Third Year	42
Fourth Year	42
Non-Credit Postgraduate Courses	58
Postgraduate Certificate Courses	55
Endodontics — First Year	4
Second Year	4
Third Year	3
Fourth Year	4

Orthodontics — First Year	9
Second Year	11
Pedodontics — First Year (full time) ..	1
Second Year (full time) ..	2
First Year (half time) ..	0
Second Year (half time) ..	0
Third Year (half time) ..	0
Fourth Year (half time) ..	2
First Year (half time) ..	0
Second Year (half time) ..	0

Cerebral Palsy Fellows

First Year	0
Second Year	1
Periodontis — First Year (full time) ..	7
Second Year (full time) ..	6
First Year (half time) ..	1
Second Year (half time) ..	0

Courses for Dental Hygienists	64
Junior Year	26
Senior Year	23
Master of Science	15
GRAND TOTAL	361

The following degrees and certificates were approved by the Faculty and awarded by the University:

Degrees:

Doctor of Dental Surgery	42
Bachelor of Science in Dental Hygiene ..	18
Master of Science in Dental Hygiene ...	13

Certificate Training:

Endodontics	4
Orthodontics	12
Pedodontics	4
Periodontics	4

Dental and Oral Surgery

MELVIN L. MOSS

Dean of the Faculty of Dental and Oral Surgery • Director of Service

New appointments to the staff of the Department of Dental and Oral Surgery are: Adjunct Associate Professor Joel Friedman; Assistant Professors Allan Blitz, David J. Zegarelli; Assistant Clinical Professor Robert Goldman; Adjunct Assistant Professor Howard S. Anstendig, Alfred Holzman, Malcolm E. Meistrell, Jr.; Instructors Phillip Bauer, Alvin Boyd, James J. Cancro, John Capriccio, Michele Darby, Harold Darwin, Richard A. Greenberg, Charlotte Hangorsky, James Johnson, Harmon Katz, Stephen Katz, Gary Lighter, Irwin Mindell, Herbert Rabinowitz, Lewis Zagon; Research Assistant Heli Vinkka.

The following promotions were made: George Hindels to Adjunct Professor, Prosthodontics; Alvin Grayson to Associate Clinical Professor, Prosthodontics; Thomas Portway to Associate Clinical Professor, Operative; Maxwell Widrow to Associate Clinical Professor, Prosthodontics; John Scarola to Adjunct Associate Professor, Prosthodontics; Joseph Kafer to Assistant Clinical Professor, Dental Auxiliary Utilization; Marlene Klyvert to Assistant Professor, Dental Hygiene; Dona McKinney to Assistant Professor, Dental Hygiene; S. Gerald Cardinale to Adjunct Assistant Professor, Dental Auxiliary Utilization; Martin Handlers to Adjunct Assistant Professor, Dental Auxiliary Utilization; George Kiriakopoulos to Adjunct Assistant Professor, Pedodontics; Alfred Mczza to Adjunct Assistant Professor, Pedodontics.

Posts and Honors

Professional posts held and honors received by the various members were: Dr. Vincent J. Abbatiello,

Gold Medal Award, Harvard Dental Alumni Assoc.; Dr. Julien W. Anderson, Ethics Committee, D.S.S. N.Y.; Peer Review Committee, 1st District Dental Society; Dr. Howard S. Anstendig, President, Eastchester Dental Society; Dr. Harold L. Applewhite, Member, Board of Directors, Hostos Community College of the City of New York; Dr. Lillian H. Bachman, Fellow, American College of Dentists; Chairman, Oral Health Committee of Greater New York; Dr. Harold D. Baumash, Treasurer, N.Y.S.S. Oral Surgeons; Dr. James W. Benfield, Chairman, Research Committee, N.Y. Academy of Dentistry, 1971-1972; Dr. Roy Boelster, Fellow N.Y. Academy of Dentistry; Dr. Sebastian A. Bruno, Fellow, International College of Dentists; President, American Academy of Maxillofacial Prosthetics; Treasurer, Greater New York Academy of Prosthodontics; Dr. Robert M. Cole, Consultant, Hudson Valley Speech Center; Dr. Neal A. Demby, Recording Secretary, Association of Neighborhood Health Center Dental Directors — Region II; Dr. Anthony L. DiMango, President, Second District Dental Society; Dr. Nicholas A. DiSalvo, Vice-President, Northeastern Society of Orthodontists; Vice-President, Angle Society of Orthodontia; Executive Council, Eastern Component, Northeastern Society of Orthodontists; Research Council, American Association of Orthodontists; Dr. Samuel F. Dworkin, Member, Standing Committee on Academic Affairs AADS; Dr. Daniel H. Fine, Chairman, Periodontology Section, AADS; Co-Chairman, Dental Education, Professional Public Relations Committee American Academy of Perio.; Dr. Joel Friedman, Vice Chairman, New York State Board for Den

stry; Dr. Monroe Gliedman, Member, Executive Board, Columbia University, Orthodontic Alumni Association; Dr. Richard Gliedman, President, Hartsdale Dental Society; Member, Executive Board, Columbia University, Orthodontic Alumni Association; Dr. Robert S. Goldman, Army Commendation Medal, U.S. Army Dental Corps; Dr. Stephen F. Goodman, Fellow, International College of Dentists; Member, Advisory Board, N.Y. Dental Service Corporation; Dr. Robert Gottsegen, Member, Executive Council, American Academy of Periodontology; Dr. George W. Hindels, Fellow, American College of Dentistry; President, Greater N.Y. Academy of Prosthodontics; Dr. Hilton Oliver Josannah, Member, Program Committee, N.Y. Public Health Association; Member, American Society for the Study of Orthodontics; Member, American Society of Dentistry for the Handicapped; Member, Harlem Oral Surgery Society; Dr. Robert J. Issacson, Chairman, Dental Assistant Program, Monmouth County; Dr. Joseph E. Kafer, Chairman, Ethics Committee, 11th District Dental Society; Dr. David Kaplan, Consultant, American Radio Association, R.F.L.-C.I.O.; Consultant, Dr. Martin Luther King Neighborhood Health Center; Dr. Marvin B. King, Member, Exhibit Committee, Dental Guidance Council for Cerebral Palsy (N.Y.); Dr. George C. Kiriakopoulos, Member, Cleft Palate Committee, Lenox Hill Hospital, N.Y.; Dr. Bert Klatskin, Fellow, American College of Dentists; Dr. Milton Klempert, Secretary, Mercer Dental Society; Dr. Seymour Koster, President, Port Chester Dental Advisory Council; Chairman, Exhibit Committee in Dental Guidance for Cerebral Palsy; Dr. Austin Kutscher, Member, Council of Dental Therapeutics, American Dental Association; Member, Cancer Training Review Committee, National Cancer Institute; Executive Editor, Journal of Thanatology; Dr. Irwin D. Mandel, Appointed to Dental Study Section, N.I.D.R.; Dr. Louis Mandel, Examiner, American Board of Oral Surgery; Editor, N.Y.S. Society of Oral Surgeons Newsletter; Treasurer, Bronx County Dental Society; Dr. Marvin Mansky, President, N.Y. Chapter of the American Society for Preventive Dentistry; Dr. Malcolm Meistrell, Secretary, Orthodontic Alumni Society, Columbia University; Dr. Frank L. Mellana, Elected the New York Academy of Dentistry and the American Academy of Gold Foil Operators; Dr. George A. Minervini, Board Member, Dental Society of the State of New York; Dr. David M. Monahan, Member, Public Relations Committee, American Academy of Periodontology; Member, Research Committee, N.Y. Academy of Dentistry; Dr. Melvin L.

Morris, Director, District VII, Foundation for the Prevention of Oral Disease; Subcommittee on Pan American Organization, American Academy of Periodontology; Dr. Bernard S. Moskow, Northeastern Society of Periodontists; Chairman, Research Committee, American Academy of Periodontology; Dr. Quentin M. Murphy, Membership Committee, 9th District Dental Society; Dr. Henry I. Nahoum, Chairman, Membership Committee, N.Y. Section, American College of Dentists; Dr. Maurice S. Phillips, Member, American Dental Association; Dr. Milton Potters, Member, PPR Committee, Academy of Periodontology; Dr. Charles A. Rogers, Delegate, Dental Society to House of Delegates, Conn. State Dental Association; Dr. Arnold Rosenberg, Member, Children Dental Health and Preventive Dentistry Committee, Yonkers Dental Society; Dr. Solomon N. Rosenstein, Member, Development & Public Relations Committee, Exhibit Committee, and Brooklyn Campus Committee, Dental Guidance Council for Cerebral Palsy; Member, Education Committee, New York State Society of Dentistry for Children; Dr. Irwin Steuer, Member, Executive Board, Eastern Dental Society; Dr. Julius Tarshis, Member, Malpractice Insurance Committee, First District Dental Society; Dr. Ennio L. Uccellani, Member, Executive Council, Greater New York Academy of Prosthodontics; Chairman, Prosthodontics Section, First District Dental Society; Dr. Arthur B. Weiss, Member, Executive Board, Eastern Dental Society; Dr. Clifford L. Whitman, Member, Presidents Cabinet, Middle Atlantic Society of Orthodontists; Dr. David H. Wolmer, President, Dental Guidance Council for Cerebral Palsy (N.Y.); Dr. Edward V. Zegarelli Inducted into the Order of the Knights of Malta; Chairman, Examination Review Committee, North East Regional Board of Dental Examiners; Member, Board of Directors and Professional Education and Grants Committee of the American Cancer Society; New York City Division; Recipient of the "Award of Merit" by the American Association of Dental Examiners.

Research

Dr. David J. Smith continues his investigations of the nature of the chemical bonds responsible for the tensile and solubility properties of collagenous tissues. He has determined that a series of bifunctional protein reagents react with amino acid side-chains near the ends of the tropocollagen molecule which appear to be involved in these tensile and solubility properties. Dr. Spyros Vratsanos continues his investigations of the mechanism of degradation of dental enamel matrix and the role of this process

in mineralization. He is also engaged in two projects in cooperation with Dr. I Mandel in the Division of Preventive Dentistry. One is concerned with the characterization of the salivary glycoproteins in cystic fibrosis. The second is a study of the protein components of dental plaque.

Endodontics Division research continued their studies concerning rapid methods of isolating, identifying and determining antibiotic sensitivity of micro-organisms found in endodontic infection, the efficacy of intervisit endodontic sealers and a histologic study of the effects of periodontal disease on the pulp of the Rhesus monkey. New research includes: the role of systemic and local immunity in root canal infections, a histologic evaluation of surgical endodontic procedures, an evaluation of the efficacy of various sterilization methods in endodontics, the establishment of a protocol for the accurate preservation of pulpal and paradental tissues for histologic preparation, an electron-microscope study of various aspects of tooth formation and innervation in tooth buds of 7, 10 and 14 day old rats.

Specific research projects in progress in the Division of Orofacial Development are: 1. palatal morphology in the syndrome of gonadal dysgenesis and its variants, (Drs. Horowitz and Morishima); 2. cephalometric analysis of craniofacial variability in children with clefts of the lip and palate (Drs. Horowitz and Vinkka) this study is being conducted as a joint project with Drs. Marcel Bettex and Brigitte Graf-Pinthus of the Children's Hospital, Bern, Switzerland; 3. delayed dental eruption—an inherited trait, (Drs. Horowitz, Chabora, Arvystas—graduate student in orthodontics); 4. cephalometric studies of mandibular morphology in children with juvenile rheumatoid arthritis (Drs. Horowitz, Marbach, Jr. Rubin, M.D., V. Kohler—graduate student in orthodontics).

Drs. Edward A. Cain, Thomas W. Portway and Roy Boelstler are progressing with their investigations of the sealing properties and pulpal response in the human adult dentition of the composite restorative materials.

Drs. Cain, Portway and Boelstler and Herbert D. Ayers are continuing their investigations in the sealing properties and hardness of powdered gold as a restorative dental material in the human dentition.

Dr. Kenneth Deesen is continuing to broaden the applications of intraoral photomicrography in teaching both the preclinical and clinical phases of operative dentistry. A close-up intraoral polaroid

system is being developed and is supported by the Wood Foundation.

Dr. James W. Benfield is investigating new methods for the refinement of dental castings.

Research projects in progress in the Pedodontics Division: Dr. Rosenstein expanded evaluation of dental findings in a study of survivors of prematurity. Earlier findings demonstrated significant correlation between dental abnormality and neurologic and psychometric abnormality in these children. Another group is being evaluated to add to these findings.

Dr. Rosenstein also continued a long range clinical study in tooth conservation in children. Newer compounds are being evaluated for comparison with earlier findings. The purpose of these studies is to develop most effective procedures for prevention of premature loss of children's teeth as a means of eliminating a major factor in etiology of malocclusion.

Dr. Seymour Koster continued a study of the intermaxillary abnormalities in cerebral palsy patient with scoliosis wearing the Milwaukee brace or body casts.

Studies undertaken by senior pedodontics postdoctoral students included the following under the general supervision of Dr. Rosenstein: An evaluation of finding in radiographs of the temporomandibular joint in cerebral palsied children in the five to ten year age group, by Dr. Barbara Rocco, in consultation with Dr. Joseph Marback; Histopathological study of pulp exposed primary teeth treated with special compounds by Dr. Indulal Nagrecha.

Under the supervision of various members of the orthodontic staff, the following studies were continued or completed: genetic influence on malocclusion, cephalometric analysis of subject with normal occlusion and good facial balance, the morphology of subjects with open bite malocclusion, the influence of Begg therapy on the palatal, occlusal and mandibular cephalometric planes, comparison of gingival condition and oral hygiene in 62 patients before and during orthodontic treatment, a study of dental occlusion in twins, the dentition in patients with clefts of lip and alveolar process, genetic influence on the mesiodistal width of deciduous anterior teeth, craniofacial changes in progressive hemifacial atrophy, interrelation of time and elastic force in the first stage of Begg treatment, a study of malocclusion in wind instrument musicians.

In addition, the following new subjects were begun: study of delayed eruption; a cephalometric

appraisal of changes in the dentofacial complex resulting from various orthodontic techniques on anterior open-bite; a study of palatal changes in open-bite patients; the morphological pattern and relationships of the mandible in patients affected by juvenile rheumatoid arthritis; post-retention changes in intercanine width; bite opening as related to mandibular plane in Begg treated cases.

Under the supervision of various members of the periodontic staff, the following studies were undertaken during the year: 1. effect of environment and genetics upon the character of marginal gingival tissue utilizing monkeys (Dr. Moskow); 2. studies on inductive properties of dentin and cementum and their relationship to adjacent bone (Dr. Morris); 3. periodontal disease in immune reactive diseases and studies of subgingival materia alba (Dr. Salkind).

During the past year, members of the Division of Preventive Dentistry have been engaged in a number of studies: 1. dental deposits-biochemical and bacteriologic aspects of composition and formation; 2. characterization of salivary proteins; 3. salivary composition in calculus formation, caries and salivary gland disease; 4. relation of salivary composition to systemic diseases; 5. composition of tears and nasal secretions (Dr. I. Mandel). 1. Salivary composition in various forms of hypertension; 2. salivary changes in digitalis toxicity; 3. salivary changes during menstrual cycle; 4. salivary changes in diabetes with Drs. Marder and Abelson. (Dr. Wotman). 1. Piezzo electric effects in bone with Dr. Bassett; 2. salivary and genetic factors in caries resistance. (Dr. Zengo). Characterization of gingival fluid and quantitative changes in periodontal disease. (Dr. Weinstein and Dr. Siegel). 1. Transport of saccharated iron oxide, horseradish peroxidase and Veillonalle endotoxin across crevicular epithelium; 2. Morphology of plaque formation; 3. Comparison of various plaque indices. (Dr. Fine). Effect of various agents on amount, composition; 3. Comparison of various plaque indices. (Dr. Goldman).

Graduate dental hygiene students working with Dr. Irwin Mandel and Dr. Robert Goldman on a calcium glycerol phosphorous (CGP) chewing gum study to determine the effect of CGP when added to chewing gum on plaque reduction, and on the effect of long term administration of antibiotics (bicillin) on the gingiva.

Drs. E. Zegarelli and David J. Zegarelli have initiated a comprehensive clinico-pathologic study of lichen planus affections of the oral cavity.

Dr. Michael Z. Marder is continuing his studies in cooperation with Drs. Irwin D. Mandel and Stephen Wotman on salivary analysis in pathologic and non-pathologic states.

Research in progress in the Oral Surgery Division: Harold Baurmash on the correlation of sialography, sialochemistry, sialometry and lip biopsy in salivary gland disease. Bertram Klatskin on the effects of local anesthesia on patients with cardiovascular disease.

Donors

The School of Dental and Oral Surgery wishes to express appreciation for contributions made in support of its programs by many individuals and organizations. Among the donors are: Achelis Foundation, Mr. Frank T. Weston, Mr. Curtis E. Calder, Mr. Andre Meyer, Shubert Foundation, Sergei S. Zlinkoff Fund, Greenebaum Foundation, J. B. Williams Company, Foundation of Thanatology, Mrs. Sara G. Feldman, Isabella Gunn Estate, Dr. Herbert Rod, Orthodontic Alumni Society of Columbia University, Block Drug Company, Warner-Lambert Company, American Dental Association, Dr. Herbert Weiss, Mr. Alfred W. Kleinbaum, United Cerebral Palsy of New York City, Dr. Gerald B. Phillips, Eleanor K. Morgenthau, Horik M. Ryebian, Dental Alumni, Class of 1931-32, Neptune Custom Cut Corp., Mr. Louis Rakin, Rains, Progrebin & Scher, Irving Kirschenbaum Foundation, Inc., Elsie Ferris, Mary Levy, M. A. Sunderland, Dr. Stanley J. Behrman, Charles P. Giel, Morris Finkelstein & Sons Foundation, Inc., Lewis Kleid Foundation, Inc., Charmer Industries, Inc., Golda R. Morrow, Mr. & Mrs. R. H. Harper, Arthur Sawitsky, M.D., Irving P. Abel, Frances Driver, Dr. William L. Levy, Davis Manufacturing Co., The Samuel Bronfman Foundation Inc., Dr. & Mrs. Peter Sheckman, Dr. Miles A. Galin, Colgate-Palmolive Company, Virginia H. Hanna, Mr. & Mrs. Paul L. Davies, Clarence & Anne Dillon Dunwalke Trust, American Association of Orthodontics, Foundation, Dr. William Kress, Mr. Eugene Fuchs, F. G. Fusee, Sidney Mann, Joseph F. Stein, Foundation.

1972 Publications

Dental and Oral Surgery

Applewhite, Harold L.

Hang-ups with the expanded use of dental auxiliaries, *The New York Journal of Dentistry*, Vol. 42, No. 8, pp. 252-258, October, 1972.

Anstendig, Howard S. and Kronman, Joseph H.

A histologic study of pulpal reaction to orthodontic tooth movement in dogs. *Angle Orthodontist* 42:1, 1972.

Benfield, James W.

Contributing Author to: Kilpatrick, Harold C. *Work Simplification in Dental Practice*. 3rd Ed., W. B. Saunders Co., Phila., Pa. Chapter on Precision dies from elastic impression materials.

Chabora, A. J.; Berkman, M. D.; Horowitz, S. L. and Nahoum, H. I.

Hereditary hypocalcified amelogenesis imperfecta, *Oral Surg., Oral Med. and Oral Pathol.*, 33:922-925, 1972.

Cuttita, Joseph A.

A candid appraisal of admissions proceedings and problems. *Journal of Dental Education*. Vol. 36, No. 4, April, 1972.

Deesen, Kenneth W.

Contributing Author to: Kilpatrick, Harold C. *Work Simplification in Dental Practice*. 3rd Ed., W. B. Saunders Co., Phila., Pa. Chapters on Intra-oral photography and patient education.

DiSalvo, N. A.; Alumbaugh, C. E.; Kwochka, W.;

Pilvelis, A. and Wilcox, J. R.

Genetic influence on Mesiodistal Width of Deciduous Anterior Teeth. *Am. J. Orthodont.* 61:473-478, 1972.

Dworkin, S. F.; Picozzi, A. and Simon, L. A.

Student-faculty contrasts in priorities for preventive dentistry and community health programs. *J. Dent. Educ.* 36:41-44, September, 1972.

Feldaman and Solomon

Intentional replantation of a molar tooth. *N. Y. St DJ*, 1972.

Geiger, A. M.; Wasserman, H. B.; Thompson, R. H., Jr. and Turgeon, L. R.

Relationship of occlusion to periodontal disease. Part V—Relation of classification of occlusion to periodontal status and gingival inflammation. *J. of Perio.* 43:9, Sept., 1972.

Gold, J. Bemby, Neal

Community dental care: Communication is the key. *Dental Survey* 48:4, April, 1972.

Grayson, D. and Dworkin, S. F.

Culture and caries, *N.Y.S. Dent. J.* 68, Jan, 1972.

Greenfield et al.

Filling root canals with files. Radiographic evaluation of 304 cases. *N.Y.S. Dent. J.* 38:154, 1972.

Horowitz, S. L.

The challenge of facial deformity (25th Northcroft Memorial Lecture). *Dent. Practit.*, 22:191-202, 1972.

Johnson, R. F. and Gottsegen, R.

Periodontal prognosis. *J. of New Jersey Dental Assoc.*, May, 1972.

Kutscher, A. H. and Reeves, R. Jr.

Hospital chaplaincy care of the bereaved at the time of a patient's death. *J. of Pastoral Care.* 26:116, June, 1972.

Kutscher, A. H. and Kutscher, L. G. (Editors)

Religion and Bereavement: Counsel for the Physician, Advice for the Bereaved; Thoughts for the Clergyman. Health Sciences Publishing Corporation, New York, 1972.

Lorin, M.; Gaerlan, P. and Mandel, I. D.

Quantitative composition of nasal secretions in normal subjects. *J. Laboratory and Clin. Med.* 80:275 1972.

Lorin, M.; Denning, D. and Mandel, I. D.

Viscosity of exocrine secretions in cystic fibrosis: Sweat, duodenal fluid and submaxillary saliva *Biocheology* 9:27, 1972.

Mandel, I. D.

New approaches to plaque prevention. *Dent. Clinics. N. Amer.* 16:21, 1972.

Mandel, I. D.; Gottsegen, R. and Fine, D.

The Plaque Diseases. Medcom, 1972.

Marder, M.; Wotman, S. and Mandel, I. D.

Salivary electrolyte changes during pregnancy. *Amer J. Obs. & Gyn.* 112:233, 1972.

Morris, M. L.

A study of the inductive properties of the organic matrix of dentin and cementum. *J. of Perio.* 43:10 1972.

Moskow, B. S.; Crikelair, G. F. and Wheaton, E. A.

A case of severe oral infection associated with prolonged steroid therapy. *Oral Surg., Oral Med., Ora Path.* 34:590, 1972.

Moskow, B. S.; Siegel, K.; Zegarelli, E. V.;

Kutscher, A. H. and Rothenberg, F.

Zahnfleischzyste und parodontalzyste. *Die Quintessenz*, April, 1972.

Moskow, B. S.

Gingival and lateral periodontal cysts. *J. New Jersey Dent. Soc.* 43:9, No. 5, May-June, 1972.

Moss, M. L.

Dynamics of sigmoid notch configuration and its relationship to total ramal morphology (with M Simon). *Acta Anat.*, 1972.

Twenty years of functional cranial analysis. *Am. J. Orthod.* 61:479-485, 1972.

The vertebrate dermis and the integumental skeleton *Am. Zool.* 12:27-34, 1972.

Bone induction. *Am. Inst. Oral Biol.* 49-58, 1972.

The non-existent hinge axis. *Am. Inst. Oral Biol.* 59-66, 1972.

The role of intrinsic and extrinsic factors in the regulation of skeletal growth. *Am. Inst. Oral Biol.* 67-78 1972.

- Transformative and translative growth processes in neurocranial development in the rat. (with M. S. Meehan and L. Salentijn.) *Acta Anat.* 81:161-182, 1972.
- Nahoum, H. I.; Horowitz, S. L. and Benedicto, E. A.
Varieties of anterior open-bite. *Am. J. Orthodont.* 61:486-492, 1972.
- Naidorf, I. J.
Infection and inflammation of pulp and periapical tissues. *OSMP*, Oct., 1972.
Microbiological abstracts, *OSMP*, 1972.
- Picozzi, A.; Dworkin, S. F.; Leeds, J.; Nash, J.
Dental and associated attitudinal aspects of heroin addiction. *J. Dent. Res.* 51:869-870, May-June, 1972.
- Rosenstein, S. N.
The teeth. In: *Pediatrics*. Barnett, H. L. 15th Ed. Appleton-Century-Crofts, New York, 1972.
- Salkind, Albert
Subgingival plaque 10 minutes after curettage. *J. of Perio.*, Feb., 1972.
- Schoenberg, B.; Carr, A.; Peretz, D. and Gutscher, A. H. (Editors)
Psychosocial Aspects of Terminal Care. Columbia University Press, New York, 1972.
- Schwartz, M.
Read those inserts! *The Explorer* (Bulletin of the Rockland County Dental Society) 13:2, Oct., 1972.
- Solomon et al.
Endodontics. Clinical diagnostic procedures and techniques. *J. Gen. Dent.*, 1972.
- Steuer, I.
The cranial base for superimposition of lateral cephalometric radiograph. *Am. J. Orthodont.* 61:486-492, 1972.
- Thompson, R. H., Jr.; Geiger, A. M.; Wasserman, B. H. and Turgeon, L. R.
Relationship of occlusion and periodontal disease. Part III—Relation of periodontal status to general background characteristics. *J. of Perio.* 43:9, Sept., 1972.
- Walsh, R. and A. Martin
Reinforcing the aseptic chain in hospital dental practice. *J. Hospital Dentistry*, Vol. VI, April, 1972.
- Wasserman, B. H.; Geiger, A. M.; Thompson, R. H., Jr. and Turgeon, L. R.
Relationship of occlusion and periodontal disease. Part IV—Relationship of inflammation to background characteristics and periodontal destruction. *J. of Perio.* 43:9, Sept., 1972.
- Weinstein, E.; Khurana, H. and Mandel, I. D.
Lactate dehydrogenase isoenzymes in gingival fluid. *Arch. Oral Biol.* 17, 1972.
- Wolmer, D. L.
A child's first dental experience. *Bull. Passaic Co. Dent. Soc. (N. J.)*, 1972, 10-14, 1972.
- Zegarelli, D. J.; Tsukada, U.; Pickren, J. W. and Greene, G.
Metastatic tumor to the tongue. Report of 12 cases. *Oral Surg., Oral Med. and Oral Path.* July, 1972.
- Zegarelli, E. V.
The patient and mouth cancer. *J. of Occupational Health and Nursing*, July, 1971.
- Zengo, A. and Mandel, I. D.
Sucrose tasting and dental caries in man. *Arch. Oral Biol.* 17, 1972.

Reports of Women's Auxiliaries

The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. CARLL TUCKER, JR., *President*

Babies Hospital has had an active if frenetic year with some disappointments but many accomplishments to be proud of. Under Dr. Behrman's enthusiastic leadership, we are beginning to see new advances both medically and in the physical plant.

The most obvious improvements are in the building program, and though construction of our new facilities has been drastically slowed due to a long builders' strike, we can look with pride at the completion of our new x-ray floor, the opening of the new four bed ward for clinical research of children with metabolic disorders, and the resumption of work on the neo-natal nursery. Additional nursing positions have been authorized for the neo-natal intensive care unit, the transitional care nursery, and the mobile unit. When the recruiting and training of this staff is completed, all these units will become operable, which will permit the mobile unit to transfer high risk infants to our neo-natal intensive care unit from surrounding and suburban hospitals. The delay in the completion of the neo-natal nursery is disappointing, but the hope is to have it operable within the next twelve months. The central laboratories are well on the way to completion. Though they have taken away free space from the children, the new rooms which have resulted, due to the construction of corridors through the wards on the fifth and sixth floors, are far brighter and more cheerful.

Miss McConville and her nursing staff have been tireless in their efforts to give superb care to all the patients under cramped and difficult conditions.

One of the highlights of our educational program this year was a workshop on "Care for the Dying Child and His Family." Two hundred pediatric nurses from ten states plus several hundred of our staff and students attended.

We suffered a few nervous months early in the year, when the Department of Health, Education and Welfare cut off our funding for our cystic fibrosis clinic. However, thanks to repeated trips to Washington, Dr. Behrman was able to have the funds restored for this year, which has enabled Dr. Denning and her staff to continue the research, care and education for these afflicted children. Dr. Denning is also assisting other metropolitan hospitals in setting up their own clinics and teams of specialists.

Our initial effort to publicize Babies Hospital go under way this year with a theatre benefit. It was well attended and thanks to the hard work of Mrs. Bayard Walker and Mrs. Orson Munn, Jr. and their committee of Board members and doctors wives, it also proved a financial success, netting over \$11,000.00.

With the proceeds from the benefit, plus many other donations, the Board of Women Managers set up a discretionary fund. Now we have immediate funds available for emergencies and special projects which we have not budgeted. This year we have been able to allocate \$600.00 towards Thrift Shop salaries, \$1,000.00 to Recreational Therapy for the Saturday movie program, \$600.00 for teacher's salary in the Social Service Department and \$100.00 monthly to Miss Dilworth for miscellaneous expenses in the Social Service Department.

Many other contributions have been received through the year and I would like to thank the donors for their interest as well as their assistance. Many of our services would have been more curtailed, due to the 5% decrease in expense requested by the Board of Trustees throughout the Medical Center, had it not been for these gifts. Two special gifts I would like to mention are: one from Mrs. James McCosh Magie for the purchase of equipment and furnishings of our pediatric clinic, in memory of Mr. Magie, and the second from Mrs. Joseph McMullan and the Beaumont Charitable Trust to finance the neo-natal mobile unit. It has been a tight year again financially, but thanks to the hospital absorbing some of the Social Service salaries we have ended the year in the black and have a projected balance for 1973.

The Emergency Nursing Fund, spearheaded by Mrs. Frederic deRham, continues to provide nursing services to acutely ill children. The \$4,000.00 allotted annually by our Board, plus many other generous gifts have enabled four patients to be cared for this year.

The United Hospital Fund, under the leadership of Mrs. Keith Moffat, raised \$17,011.00 from 19 gifts. Box week netted another \$557.00, making a total for this year \$17,568.00 raised.

The Recreational Therapy Department has undergone many changes, but with the close liaison of Mrs. Bradley Collins and the Directors, the department has again conquered multiple challenges. Mi

Cynthia LePore left in September to continue her studies and the Director's job is now filled by Miss Sylvia Netzer. Miss Netzer has worked with Miss LePore and has managed this transition, despite the cramped and inadequate facilities, magnificently. This department has made 18,366 patient contacts in 1972, as well as 2,753 school room visits.

Mrs. K. Herluf Trudso and her Thrift Shop committee, netted \$16,914.69 this year. An incredible achievement, but with the untiring work of Mrs. Trudso and Miss Hope Kingsley, the impossible was managed despite the continued lack of volunteer

help. This is our major source of income and we are most grateful to these two ladies for their dedicated service.

I cannot end this report without a special word of thanks to Miss Ann Cavanagh for her leadership, cooperation and tireless efforts which have resulted in keeping a congested building and dedicated staff providing the best in medical care for our young patients. Her cheerfulness and constant attention to every detail make every experience for patient and family as happy as possible at Babies Hospital.

Cribside Social Service Committee

MRS. WILLIAM E. HILL, *Vice President*

It is my honor to submit this report on behalf of The Cribside Social Service Committee of The Board of Women Managers of Babies Hospital.

Due to serious financial cut-backs, we have had to redirect our efforts on behalf of the Social Service Department. One hundred thirty-eight children were sent to camp last summer. We concentrated, in the main, on the physically handicapped and attempted to utilize as many free placements as possible. Endowed beds were approved for ten needy children during this year.

Since our Thrift Shop is our main source of revenue, we continued to be in debt to Mrs. K. Herluf Trudso, the Chairman, Miss Hope Kingsley, the Vice Chairman, and their splendid committee for their valient and tireless efforts on behalf of Babies Hospital. I would like to express my personal thanks to each and every one of them for their continued enthusiasm and dedicated service. Without them, we could not continue to meet our children's needs. Mrs. Trudso gave a luncheon for her Committee at Harkness Pavilion this Fall, after which they were given a tour of the Hospital. They were most interested to see where the funds they raise are being used.

Mrs. James McCosh Magie donated \$20,000 in memory of her late husband. Of this money, \$6,000

is to go to the Pediatric Clinic for refurbishing the Emergency Room, principally.

Mrs. Herman L. Hoops donated \$200 toward the needs of Recreational Therapy, and \$300 for cash Christmas gifts for needy children known to Social Service.

Our meetings have been greatly enhanced by the guest speakers who are shared with us by the Board of Women Managers. Once a year we have our own speaker from the Social Service Staff. This year it was Miss Esther Ridder, who offered an interesting and comprehensive view of the abortion program at the Medical Center.

We have been fortunate in having a stable Social Service Staff this year. A new grant position was added for Allergy & Asthma, bringing our total to three grant positions.

I continue to be most grateful to each and every member of our Committee for their hard work, support and encouragement. I also wish to thank our Social Service Staff at Babies Hospital and, in particular, Miss Agnes D. Dilworth, the Associate Director, for their contribution to the social needs of the children coming to their attention, both in the Pediatric Clinics and in the Hospital. Their social work expertise is invaluable in terms of the serious social pathology inherent in today's living.

Women's Auxiliary of the Neurological Institute

MRS. JOHN L. WEINBERG, *Chairman*

For the Neurological Institute Auxiliary, 1972 has been a year of re-evaluation and consolidation. Priorities as before were in the areas of continuing care and patient follow through.

The Auxiliary again appropriated \$3,675 toward the salary of Mrs. Midge Fleming, Nurse Specialist in the Neurology Clinic. With participation by members of the multi-disciplinary patient care team, she promotes continuity of care for patients of the ward and out-patient services of the Neurological Institute.

Through financial support and volunteer services, the Auxiliary continued to encourage Social Service efforts not only to meet the care needs of patients but also to expand understanding of problems encountered by patients coping with illness and social planning required in overcoming these problems. The foresightedness, resourcefulness, and dedication shown by Miss Jean Collard, Associate Director of Social Service, have earned the increasing respect of the Auxiliary.

Social Service expenditures met by the Auxiliary amounted to \$24,469.30 during the year. Services to patients included financial assistance for emergency maintenance, clothing, appliances, transportation, homemaker, etc., in the amount of \$2,591.05. Special camp placements for 42 seizure children and one adult amounted to \$14,617.50. The Auxiliary augmented by \$1,304.50 funds of \$12,250 from the "Big E for Epilepsy," \$500 from the Society for the Relief of Women and Children and \$478 from parents. The Haven Relief Fund Society donated \$800 through our loyal Almoner Mrs. Charles Adams.

Research costs for two significant projects come to \$2,320. Funds remaining in the Helen L. Weinberg Memorial Grant helped advance the research program by financing Mrs. Myrna Alpert's work organizing the patient care data in the Washington Heights Community for presentation at the symposium on "Planning Home Care Services for the Chronically Ill and Elderly." The Auxiliary also directly supported the computerization costs of obtaining data on brain tumor patients. This data was used to implement a grant proposal by the Social Service Department on "Planning for the Total Care Needs of the Brain Tumor Patients," one section of the Cancer Center Research Institute proposal. As a

result of this the Social Service Department's first major research program on the social aspects of illness was recommended for funding by the National Cancer Institute.

For the staff recruitment and development program, appropriated funds amounted to \$1,075.08 for the Careers in Social Work program and \$420 for inservice staff development. The latter included a Spanish language course for social workers and the on-going staff case seminar program, both of which brought specialists to the Department for staff training. The Careers program interests college students in a career in social work through the eight-week summer work experience in the Department.

Salaries and administrative costs amounted to \$16,385.11. Included were conference fees which enabled two members of the Social Service Department, Mrs. Karen Wiley and Mrs. Kathleen Avedon, to attend a week-long conference on "Cancer and Treatment of the Dying Cancer Patients" at Memorial Hospital and Miss Collard to represent the Institute at the Northeast Regional meeting of the National Council on the Aging.

Besides financial aid, several members of the Auxiliary have provided service to the Social Service Department through volunteer efforts. Mrs. George Spater and Mrs. Edward Schlesinger have continued to visit nursing homes, evaluating services and quality of care. Mrs. Spater has been named Co-Chairman of the Joint Nursing Home Committee of the United Hospital Fund and the Community Council of New York. Mrs. Carl Chadsey has contributed work on various research projects.

Other Auxiliary volunteers are Mrs. Richard Masland in charge of the children's playroom project and children's books in the Clinic and Mrs. Edward Gardner who worked on improving the appearance of the Neurology Clinic. Many thanks go to Miss Elizabeth McCarthy, Head Nurse in the Clinic, Miss Martha Haber, Director of Nursing in Neurological Institute and Miss Barbara Farace, Unit Manager for their cooperation and support.

This report would be incomplete without praise of our dedicated Chairmen who led our two major on-going fund raising efforts. Mrs. Charles Adams and her United Hospital Fund Committee raised \$26,185.63. The Thrift Shop chaired by Mrs. Royall

Cannaday and manned by Mrs. H. Houston Merritt, Mrs. Charles E. Stroud and Mrs. Niels Low reported sales of \$22,451 and distribution of \$12,614.25, in spite of insufficient volunteer help.

The enthusiasm of the Auxiliary was spurred by several speakers during this year. Mrs. Katrina de Hirsch spoke on reading difficulties and minimal brain disfunction, Mr. Binkert brought to the forefront both problems and progress caused by the accelerating changes in health care. Dr. Richard Masland introduced each speaker. One of the intangible benefits of being part of the Auxiliary is the opportunity to know Dr. Masland. His vision, philosophical yet practical approach to the most difficult problems and his broad perspective are an inspiration. We are all grateful for his attentive help.

Along with projects serving Neurological Institute,

the Auxiliary participates in several Medical Center activities. \$7,000 is provided for the Milbank Library and \$1,900 for the Presbyterian Hospital Volunteer Program. Members of the Auxiliary enjoy invitations to informative luncheons each month given by Mr. A. J. Binkert, the Administrator of the Hospital. We are most appreciative for the time, advice and guidance given us by Mr. Binkert and Dr. Carl R. Wise.

I feel privileged to have the opportunity to work with the members of the Neurological Institute Auxiliary. As change accelerates, it becomes even more important to attract and motivate this caliber of membership, competent, responsive, and responsible, to explore innovative ways to help meet multiplied complexities of old and new problems in hospital care.

Women's Auxiliary of the New York Orthopaedic Hospital

MRS. GEORGE SIM JOHNSTON, JR., *President*

During my final year as President of the Auxiliary, I have tried to keep our Board better informed by having more speakers at our monthly meetings. Dr. Andrew Bassett spoke to us about the orthopaedic research that the Hospital is doing. Dr. Nas S. Eftekhar gave us a talk on total hip replacement. Dr. Behrman, Mr. Masten and Mr. Cleary told us about the plans for the new Babies Hospital. In December the Board members took a tour of the Medical Center.

At most of our monthly meetings we have had reports from Miss Rosemary Hoynak, our head nurse. The interest and compassion she displays towards her patients is inspiring. Also, guests at our monthly meetings were our recreational therapists, Mrs. Eva Hoffman and Mrs. Lisa Jantzen. Mrs. Hoffman continues her wonderful work with the children, but has reduced her working schedule from four-and-a-half to four days. Mrs. Jantzen and her volunteers are a continuing success and we have received much praise from the patients about their work.

It was with great regret that the Board accepted the resignation of Mrs. A. Neil Lilley, who so ably ran our United Hospital drives. We welcomed Mrs. Keith Highet as a new member to the Board.

Our solarium in the babies section has been divided into two sections. One room is being used by

our teacher and the other by our occupational therapist. Our twelve-bed children's ward was also divided into two rooms. Air conditioning was installed in the plaster room and three other patients' rooms.

Mrs. Edward H. Gerry has taken over the leadership of the United Hospital Fund drive. As of December 11, 1972, the auxiliary has raised \$24,063 and our direct benefit quota is \$12,960.

The budget for the year included support for the care of ward and clinic patients, salaries for two recreational therapists, recreational therapy supplies, partial salary for an assistant librarian in the Milbank Library, Spanish lessons for the Social Service Staff and contributions for running the department. The total expenditures of the Auxiliary for 1972 were \$45,755 which included \$19,692 for ward and clinic patients.

I wish to thank all the members of the Board for their continuing support, especially Mrs. Hugo A. Keim, our very able secretary, and Mrs. Donald Wallace, our most efficient treasurer.

The question of the future of the Auxiliaries is greatly on the minds of all the heads of the Auxiliaries. I believe a thorough study should be made of the possibility of merging all the Auxiliaries for more versatility, strength and efficiency.

Women's Auxiliary of the Presbyterian Hospital

MRS. GEORGE A. CARDEN, *Chairman*

The past year has been a successful one for the Auxiliary, due in great part to the increased efforts of its members. We now have 69 active members, 36 associates and 8 junior associates. We welcomed as new active members Mmes. Albert R. Perry, Jr., Joseph Silverman, and Max Forbes. Mrs. John Gaines joined us as a junior associate. We accepted with regret the resignations of Mmes. Herbert H. Schramb, Richard deL. Simmonds and J. Crosby Brown as active members. Mrs. Howard C. Taylor transferred to associate membership from which Mmes. Stanley M. Bysshe and Mrs. B. Dewitt Bleecker resigned. We record with regret the death of an associate member, Mrs. Stephen B. Haynes.

A gross income of \$62,903 as against expenditures of \$50,346 leaves us in better financial shape than previously. This is due in part to the stalwart efforts of Mrs. Carl Truman Nelson, chairman of the United Hospital Fund Committee and her team. They raised \$46,833 from 580 gifts. Of this \$31,423 went to Presbyterian Hospital in direct benefits.

The remainder of our income was derived from the Stuyvesant Square Thrift Shop which netted us approximately \$25,936. In spite of increased overhead and a chronic shortage of volunteers this represents a substantial increase thanks to the energetic leadership of Mrs. Equinn M. Munnell, the Thrift Shop Chairman and her loyal 'regulars'. The supply of inventory for the Thrift Shop was assured by the annual Luncheon and Fashion Show whose attendance is limited to contributors throughout the year of thrift valued at \$25 or more. It was not held until January 1973 in order to free it from United Hospital Fund money raising restrictions. As a result it did realize a small profit. Mrs. Cornelius J. Tyson, Jr. and her committee organized a delightful luncheon at the Pierre Hotel with a showing of spring fashions by Kasper and preceded by a brief talk by Dr. Robert H. E. Elliott, Educational Consultant in Health Sciences at the Hospital, on recent developments in the paramedical field.

Under the chairmanship of Mrs. David L. Andrews, the Nursing Committee is in the process of

forming an Intra-Auxiliary Committee to help support the Department of Nursing and bring the Auxiliaries into closer touch with its problems. The Annual Card Party and Tea for the benefit of the Student Nurse Scholarship Fund, held on April 20th under the able leadership of Mrs. Bruce D. Williams, netted \$17,113.

Early in 1972 the Milbank Library moved into its new quarters. February saw the beginning of book cart service in Harkness, an addition long awaited by Mrs. John VanB. Dean, the Library Committee chairman. It has proved a most welcome service. Book sales netted the library nearly \$1400 and grateful patients made gifts totalling \$750. 13,223 patients were served with 16,581 books during the year — a new and splendid record.

The Auxiliary no longer supports Occupational Therapy, but Recreational Therapy remains one of our major interests, with Mrs. Hilary Holmes as chairman. After several changes of staff, Mr. William McKee, whose salary we pay, is now in charge. He is an enthusiastic young therapist and under his supervision the program is slowly enlarging and attracting more volunteers. Twenty-three of them served a total of 5325 hours.

Under the chairmanship of Mrs. Gerard DeVoe the Social Service Committee contributed a social service case seminar financed by the Kneeland Fund and allotted \$1400 from the Haven Relief Fund for patients' special needs and for Spanish lessons for the staff. In addition a \$1000 research fund has been used to aid a doctoral candidate.

The Auxiliary continues to seek out new volunteers. It provides a number of parking permits to workers of at least six months service. During 1972 a total of 909 volunteers served 109,161 hours, a heartening increase of 8068 hours over 1971.

Requests for a gift shop located in the Medical Center are being heard from all sides: social service, nursing and hospital staffs as well as patients. It appears to be a crying need and one which we hope our combined auxiliaries can fulfill in the near future.

As I turn the chairmanship over to the able hands of Mrs. Francis H. Cabot, Jr., I wish to thank the entire Auxiliary for its support and in particular my fellow officers and committee chairmen for their

patience and hard work. I am also most grateful to the secretarial staff at the Hospital for their unflagging help throughout my tenure.

Trustees and Committees

The Presbyterian Hospital in the City of New York
and Columbia University in the City of New York

Trustees of Columbia University in the City of New York

WILLIAM J. MCGILL, *President of the University*

WILLIAM E. PETERSEN, *Chairman*
Vice Chairman of the Board
Irving Trust Company

HAROLD F. MCGUIRE, *Vice Chairman*
Senior Partner
Wickes, Riddell, Bloomer,
Jacobi & McGuire

FRANK S. HOGAN, *Vice Chairman*
District Attorney
New York County

HAROLD A. ROUSSELOT, *Clerk*
Chairman
F. I. duPont, Glore Forgan & Company

BENJAMIN J. BUTTENWIESER, *Associate Clerk*
Limited Partner
Kuhn, Loeb & Company

PAUL A. MARKS, M.D., *Dean, College of Physicians & Surgeons*
Vice President in Charge of Medical Affairs

*Douglas M. Black
President (Retired)
Doubleday & Co., Inc.

Arthur B. Krim
(Alumni Trustee 1967-1973)
Chairman and Chief Executive Officer
United Artists Corporation

*Walter H. Sammis
Director
Ohio Edison Co.

Frederick vanPelt Bryan
U. S. District Judge

Robert D. Lilley
(Alumni Trustee 1968-74)
Executive Vice President
American Telephone &
Telegraph Company

Arthur O. Sulzberger
President and Publisher
The New York Times

William A. M. Burden
Partner
William A. M. Burden & Co.

*Alan H. Temple
Retired Vice Chairman
First National City Bank of New York

*Andrew W. Cordier
President Emeritus

Charles F. Luce
Chairman and Chief Executive Officer
Consolidated Edison Company
of New York, Inc.

Franklin A. Thomas
(1969-75)
President
Bedford Stuyvesant Restoration Corp.

Daniel F. Crowley
(Alumni Trustee 1969-75)
Executive Vice President
McGraw Hill, Inc.

Thomas M. Macioce
President
Allied Stores Corporation

Samuel R. Walker
Real Estate Consultant

Carl W. Desch
Senior Vice President
and Cashier
First National City Bank

*Adrian M. Massie
Member of the Trust Committee
Chemical Bank

Lawrence E. Walsh
(1969-74)
Partner
Davis Polk & Wardwell

*Lester D. Egbert
Chairman of the Board (Retired)
Brown, Crosby & Co.

Charles M. Metzner
U. S. District Judge

*Robert W. Watt

William T. Gossett
Member of
Dykema, Wheat, Spencer,
Goodnow & Trigg

*Maurice T. Moore
Partner
Cravath, Swaine & Moore

W. Clarke Wescoe
(1969-75)
Vice President
Sterling Drug, Inc.

*Grayson Kirk
President Emeritus
Columbia University

William S. Paley
Chairman of the Board
Columbia Broadcasting System, Inc.

M. Moran Weston
(1969-75)
Rector
St. Philip's Episcopal Church

* Emeritus

Joint Administrative Board

The Presbyterian Hospital in the City of New York
and

Columbia University in the City of New York

Hospital Trustees

Augustus C. Long
Malcolm P. Aldrich
A. J. Binkert
Roger M. Blough
Lucius D. Clay
Fredrick M. Eaton
Frederick R. Kappel
Frederick A. O. Schwarz

University Trustees

William J. McGill
Benjamin J. Bittenwieser
Daniel F. Crowley
William T. Gossett
Frank S. Hogan
Robert D. Lilley
William E. Peterson
W. Clarke Wescoe, M.D.

Trustees of the Columbia-Presbyterian Medical Center Fund, Inc.

William J. McGill, *Chairman*
Malcolm P. Aldrich
A. J. Binkert
Benjamin J. Bittenwieser
Lucius D. Clay
Daniel F. Crowley, *Treasurer*
Carl W. Desch
Fredrick M. Eaton

William T. Gossett
Harold H. Helm
Frank S. Hogan
Frederick R. Kappel
Robert D. Lilley
Augustus C. Long
Frederick A. O. Schwarz, *Vice-Chairman*
W. Clarke Wescoe, M.D.

Trustees and Officers of The Presbyterian Hospital in the City of New York

CLEO F. CRAIG, *President Emeritus*

AUGUSTUS C. LONG, *Chairman of the Board*
Chairman of the Executive Committee, Texaco Inc.

THOMAS H. CHOATE, *Vice Chairman of the Board*

A. J. BINKERT, *President*

ROGER M. BLOUGH, *Vice President*
Partner, White & Case

LUCIUS D. CLAY, *Vice President*
Senior Managing Director,
Lehman Brothers Incorporated

FREDRICK M. EATON, *Vice President*
Partner, Shearman & Sterling

HAROLD H. HELM, *Vice President*
Chairman of the Executive Committee,
Chemical Bank

FREDERICK R. KAPPEL, *Vice President*
Retired Chairman of the Board,
American Telephone and Telegraph Company

FREDERICK A. O. SCHWARZ, *Vice President*
Partner, Davis Polk & Wardwell

JOSEPH A. THOMAS, *Vice President*
Senior Managing Director,
Lehman Brothers Incorporated

JOHN A. GIFFORD, *Secretary*
Partner, White & Case

JAMES W. WALKER, *Assistant Secretary*
Investment Management

THATCHER M. BROWN, JR., *Treasurer*
Vice Chairman of the Board,
Senior Vice President and Director,
G. H. Walker & Co. Incorporated

JAMES W. FOLEY, *Assistant Treasurer*
Retired Vice Chairman, Texaco Inc.

TRUSTEES

Hulbert S. Aldrich
Chairman,
Hill Samuel Inc.

Malcolm P. Aldrich
Honorary Chairman of the Board,
The Commonwealth Fund

Nicholas F. Brady
President,
Dillon, Read & Co. Inc.

Mrs. B. Rionda Braga

John W. Brooks
President and Chief Executive Officer,
Celanese Corporation

Carter L. Burgess
Chairman of the Board,
Flagship International, Inc.

James M. Clark
Chairman of the Finance Committee,
Hornblower & Weeks-
Hemphill, Noyes Incorporated

Arthur Gerard DeVoe, M.D.
Director, Ophthalmology Service,
The Presbyterian Hospital in the
City of New York

George S. Dillon
Chairman of the Board,
Aircor, Inc.

Frederic G. Donner
Chairman of the Board,
Alfred P. Sloan Foundation

Thomas C. Fogarty
Retired Chairman of the Board,
Continental Can Company, Inc.

Mrs. Edward H. Gerry

W. E. S. Griswold, Jr.

Lawrence C. Kolb, M.D.
Director, Psychiatry Service,
The Presbyterian Hospital in
the City of New York

Mrs. Robert James Lewis

Alfred L. Loomis, Jr.
St. Vincents Island Company

Paul A. Marks, M.D.
*Vice President in Charge of Medical
Affairs and Dean of the Faculty
of Medicine,*
Columbia University

Birny Mason, Jr.
Chairman, Executive Committee,
Union Carbide Corporation

Thomas P. F. Milbank
Corporate Executive

Milton C. Mumford
Director and Retired Chairman,
Lever Brothers Company

Charles A. Ragan, Jr., M.D.
Director, Medical Service,
The Presbyterian Hospital in
the City of New York

H. I. Romnes
Chairman of the Executive Committee,
American Telephone and Telegraph
Company

TRUSTEES (Cont.)

Dorrance Sexton
Retired Chairman of the Board,
Johnson and Higgins

Frank E. Stinchfield, M.D.
President, Medical Board,
The Presbyterian Hospital in the
City of New York

Charles H. Symington, Jr.
Senior Vice President and Treasurer,
G. H. Walker & Co. Incorporated

Mrs. Henry C. Taylor

Mrs. Carll Tucker, Jr.

Cyrus R. Vance
Partner,
Simpson Thacher & Bartlett

Arthur K. Watson

Sidney J. Weinberg, Jr.
Partner,
Goldman Sachs & Co.

Robert Winthrop
Honorary Chairman,
Wood, Struthers & Winthrop, Inc.

HONORARY TRUSTEES

Winthrop W. Aldrich

August Belmont
Chairman,
Dillon, Read & Co. Inc.

Edward C. Bench

John E. Bierwirth
Chairman of the Board,
National Distillers and
Chemical Corporation

William Sheffield Cowles
Retired

Cleo F. Craig
President Emeritus

Mrs. Frederic F. deRham

John M. Franklin
Retired Chairman of the Board,
United States Lines Company

Artemus L. Gates

George Lauder Greenway
Honorary Chairman, Metropolitan
Opera Association

Peter Grimm
Chairman of the Board,
William A. White & Sons

Perry E. Hall
Limited Partner,
Morgan Stanley & Co.

Charles Barney Harding
Member of the Advisory Board,
Smith, Barney & Co. Incorporated

Samuel W. Meek
Publisher

Rev. John O. Mellin, D.D.
Minister, First Presbyterian
Church

Charles S. Munson
Honorary Chairman,
Airco, Inc.

Robert D. Murphy
Honorary Chairman of the Board,
Corning Glass International

Charles S. Payson
Retired

Rev. Norman Vincent Peale, D.D.
Senior Minister, Collegiate
Church of New York

Rev. James Gray Spence
Minister, Second Presbyterian
Church

John P. Stevens, Jr.
Retired Chairman of the Board,
J. P. Stevens & Co., Inc.

Benjamin Strong

Frederick Sturges, Jr.

Kenneth C. Towe

Mrs. Sheldon Whitehouse

COMMITTEES OF THE BOARD OF TRUSTEES

EXECUTIVE

Augustus C. Long, *Chairman*
Malcolm P. Aldrich
A. J. Binkert
Roger M. Blough
Thatcher M. Brown, Jr.
Thomas H. Choate

Lucius D. Clay
Fredrick M. Eaton
James W. Foley
John A. Gifford, *ex-officio*
Harold H. Helm
Frederick R. Kappel
H. I. Romnes

Frederick A. O. Schwarz
Frank E. Stinchfield, M.D.
Joseph A. Thomas
Cyrus R. Vance
Sidney J. Weinberg, Jr.
Robert Winthrop

MEDICAL BOARD

Frank E. Stinchfield, M.D., *President*

John H. Laragh, M.D., *Vice President*

Daniel C. Baker, Jr., M.D.
Richard E. Behrman, M.D.
Adam Bender, M.D.
A. J. Binkert
Chu H. Chang, M.D.
Solan Chao, M.D.
Mary I. Crawford, R.N.
Robert C. Darling, M.D.
Carolyn R. Denning, M.D.
Arthur Gerard DeVoe, M.D.
Lynne T. Greene, M.D.
Frederic P. Herter, M.D.
Brian F. Hoffman, M.D.
Donald A. Holub, M.D.

Michael Katz, M.D.
R. N. Kerst
Donald W. King, M.D.
Lawrence C. Kolb, M.D.
John K. Lattimer, M.D.
John Lindenbaum, M.D.
William P. Lovejoy, M.D.
Sidney Malitz, M.D.
James R. Malm, M.D.
Paul A. Marks, M.D.
Richard L. Masland, M.D.
Melvin L. Moss, D.D.S.
Lester A. Mount, M.D.

Charles S. Neer, II, M.D.
Carl T. Nelson, M.D.
Shih-Hsun Ngai, M.D.
Charles A. Ragan, Jr., M.D.
Keith Reemtsma, M.D.
James A. Reiffel, M.D.
Myron S. Roberts, M.D.
Daniel Sciarra, M.D.
William B. Seaman, M.D.
W. Duane Todd, M.D.
Raymond L. Vande Wiele, M.D.
Arthur B. Voorhees, Jr., M.D.
Mary E. Windrow, R.N.
James A. Wolff, M.D.

Honorary Members

Dana W. Atchley, M.D.
D. Anthony D'Esopo, M.D.
John H. Dunnington, M.D.
George W. Fish, M.D.
George H. Humphreys, II, M.D.

Robert F. Loeb, M.D.
Rustin McIntosh, M.D.
H. Houston Merritt, M.D.
J. Lawrence Pool, M.D.
Harry M. Rose, M.D.
Fordyce B. St. John, M.D.

Lawrence W. Sloan, M.D.
Alan DeForest Smith, M.D.
Hamilton Southworth, M.D.
Howard C. Taylor, Jr., M.D.
Benjamin P. Watson, M.D.

AUDITING

John A. Gifford, *Chairman*

Dorrance Sexton

James W. Walker

Robert Winthrop

DOCTORS' OFFICES

George R. Merriam, Jr., M.D., *Chairman*

Charles M. Steer, M.D., *Vice-Chairman*

Charles S. Neer, II, M.D., *Secretary*

Daniel C. Baker, Jr., M.D.

Felix E. Demartini, M.D.

Charles A. Ragan, Jr., M.D.

Harold G. Barker, M.D.

Lawrence C. Kolb, M.D.

Gilbert Simon, M.D.

Richard E. Behrman, M.D.

John K. Lattimer, M.D.

Hamilton Southworth, M.D.

A. J. Binkert

Paul A. Marks, M.D.

Frank E. Stinchfield, M.D.

George F. Crikelair, M.D.

Lester A. Mount, M.D.

Raymond L. Vande Wiele, M.D.

Robert C. Darling, M.D.

Carl T. Nelson, M.D.

Melvin D. Yahr, M.D.

Milton R. Porter, M.D.

EMPLOYEE BENEFITS

A. J. Binkert, *Chairman*

C. Douglas Auty, *Secretary*

Richard N. Kerst

Carl R. Wise, M.D.

FINANCE

Roger M. Blough, *Chairman*

Thatcher M. Brown, Jr., *Vice-Chairman*

Frederic G. Donner, *Vice-Chairman*

Thomas H. Choate

Joseph A. Thomas

Harold H. Helm

Sidney J. Weinberg, Jr.

Robert Winthrop

NOMINATING

Fredrick M. Eaton, *Chairman*

John E. Bierwirth

Samuel W. Meek

Roger M. Blough

Dorrance Sexton

Thatcher M. Brown, Jr.

Mrs. Henry C. Taylor

Frederic G. Donner

James W. Walker

PLANNING AND REAL ESTATE

Frederick R. Kappel, *Chairman*

Malcolm P. Aldrich, *Vice-Chairman*

John E. Bierwirth

Peter Grimm

Benjamin Strong

Thatcher M. Brown, Jr.

Samuel W. Meek

Joseph A. Thomas

John A. Gifford

Thomas P. F. Milbank

Kenneth C. Towe

Charles S. Munson

The Presbyterian Hospital in the City of New York

Women's Auxiliaries

The Presbyterian Hospital in the City of New York

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

(Including Cribside Social Service Committee)

Officers

Mrs. Carll Tucker, Jr., *President*
Mrs. Carll Tucker, *Honorary Vice-President*
Mrs. William E. Hill, *Vice-President*
Mrs. Grover O'Neill, Jr., *Vice-President*
Mrs. Keith Moffat, *Treasurer*
Mrs. Iredell W. Iglehart, *Recording Secretary*
Mrs. Harry W. Havemeyer, *Assistant Recording Secretary*
Mrs. Andrew C. Wetmore, *Corresponding Secretary*
Mrs. Bayard Walker, *Assistant Corresponding Secretary*
Mrs. William E. Hill, *Chairman, Cribside Social Service Committee*
Mrs. K. Herluf Trudso, *Chairman, Cribside Thrift Shop Committee*

Active Members

Mrs. Munn Baker	Mrs. Herman L. Hoops	Mrs. Grover O'Neill, Jr.
Mrs. Neville J. Booker	Mrs. Iredell W. Iglehart	Mrs. Felix R. Pierot
Mrs. B. Rionda Braga	Miss Hope Kingsley	Mrs. William Rand
Mrs. Bradley I. Collins	Mrs. James McCosh Magie	Mrs. John H. Reynolds
Mrs. Casimir deRham	Mrs. Bradley Manice	Mrs. R. Peter Rose
Mrs. Frederic F. deRham	Mrs. Allen F. Maulsby	Mrs. Thomas V. Santulli
Miss Ethel F. Donaghue	Mrs. Joseph V. McMullan	Mrs. Daniel B. Strickler, Jr.
Miss Doris Duke	Mrs. Luiz Meirellas	Mrs. Henry C. Taylor
Mrs. Leo C. Fennelly	Mrs. Manton B. Metcalf, Jr.	Mrs. John S. Tilney
Mrs. Franklyn Griffin	Mrs. Richard Migel	Mrs. K. Herluf Trudso
Mrs. Melvin M. Grumbach	Miss Dorothy Mills	Mrs. Carll Tucker
Miss Ida Guerin	Mrs. Keith Moffat	Mrs. Carll Tucker, Jr.
Mrs. Harry W. Havemeyer	Mrs. Orson Munn	Mrs. Bayard W. Walker
Mrs. Fred L. Heyes	Mrs. Grover O'Neill	Mrs. John L. Weinberg
Mrs. William E. Hill		Mrs. Andrew C. Wetmore

Associate Members

Mrs. Anne T. Broadhurst	Mrs. Lewis B. Harder	Mrs. Rodman B. Montgomery
Mrs. Robert Brooke	Mrs. J. Taylor Howell	Mrs. George G. Tenney
Mrs. Benjamin Coates	Mrs. Munn Kellogg	Mrs. William Thompson
Miss Dorothy Cockshaw	Mrs. Howard McAteer	Mrs. Douglas Williams

NEUROLOGICAL INSTITUTE AUXILIARY

Mrs. John L. Weinberg, *Chairman*
 Mrs. Hart Fessenden, *1st Vice-Chairman*
 Mrs. George Spater, *2nd Vice-Chairman*
 Mrs. Sidney J. Weinberg, Jr., *Recording Secretary*
 Mrs. Niels L. Low, *Corresponding Secretary*
 Mrs. Carl Chadsey, Jr., *Treasurer*

Active Members

Mrs. Charles E. Adams	Mrs. Irving B. Kingsford, Jr.	Mrs. Henry A. Riley
Mrs. Alvin G. Brush	Mrs. Lawrence C. Kolb	Mrs. John E. Scarff
Mrs. Carter L. Burgess	Mrs. Rush Harrison Kress	Mrs. Edward B. Schlesinger
Mrs. Royall G. Cannaday	Mrs. Niels L. Low	Mrs. George A. Spater
Mrs. Carl Chadsey, Jr.	Mrs. Gavin K. MacBain	Mrs. John Hoyt Stookey
Mrs. James W. Correll	Mrs. James C. Mackenzie	Mrs. Charles E. Stroud
Mrs. Robert M. Estes	Mrs. Richard L. Masland	Mrs. John L. Weinberg
Mrs. Hart Fessenden	Mrs. Rollo J. Masselink	Mrs. Sidney J. Weinberg, Jr.
Mrs. Edward Gardner, Jr.	Mrs. H. Houston Merritt	Mrs. Frank T. Weston
Mrs. Harry Henshel	Mrs. H. McLeod Riggins	Mrs. Earl Kress Williams

Associate Members

Mrs. Edith M. Achilles	Mrs. Ralph Cordiner	Mrs. Robert James Lewis
Mrs. Roger M. Blough	Mrs. Donald K. David	Mrs. J. Lawrence Pool
Mrs. Charles P. Cooper	Mrs. William W. Foshay	Mrs. John Sloane
Mrs. H. S. Fenimore Cooper		Mrs. Willis D. Wood

Honorary Members

Mrs. Charles S. Munson	Mrs. Stuart D. Preston	Mrs. Walter N. Rothschild
------------------------	------------------------	---------------------------

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL

Mrs. Francis H. Cabot, Jr., *Chairman*
 Mrs. John VanB. Dean, *Vice-Chairman*
 Mrs. Ralph H. Boots, *Vice-Chairman*
 Mrs. Joseph A. Buda, *Treasurer*
 Mrs. Bruce D. Williams, *Recording Secretary*
 Mrs. Charles F. Morgan, *Corresponding Secretary*

Active Members

Mrs. David L. Andrews	Mrs. Douglas S. Damrosch	Mrs. William H. Gorman, II
Mrs. Frederick R. Bailey	Mrs. John VanB. Dean	Mrs. Robert S. Grinnell
Mrs. C. Redington Barrett	Mrs. Andrew deRoethth, Jr.	Mrs. Hilary H. Holmes
Mrs. Ralph H. Boots	Mrs. Arthur Gerard DeVoe	Mrs. Calderon Howe
Mrs. Harold W. Brown	Mrs. Richard B. Duane, Jr.	Mrs. George H. Humphreys, II
Mrs. Joseph A. Buda	Mrs. William Dunaway	Mrs. Frode Jensen
Mrs. Thomas A. Burke	Mrs. Robert H. E. Elliott, Jr.	Mrs. Walton P. Kingsley
Mrs. Francis H. Cabot, Jr.	Mrs. Robert M. Ellsworth	Mrs. John M. Kinney
Mrs. George A. Carden	Mrs. Carl R. Feind	Mrs. John G. Leness
Mrs. E. Foster Conklin	Mrs. Jose M. Ferrer, Jr.	Mrs. Francis A. L'Esperance, Jr.
Mrs. William C. Cooper	Mrs. Charles A. Flood	Mrs. James C. Manny
Mrs. Howard R. Craig	Mrs. Max Forbes	Mrs. Paul A. Marks
Mrs. Virgil G. Damon	Mrs. Henry Clay Frick, II	Mrs. Malcolm H. McAllister

Active Members

Mrs. George W. Melcher, Jr.
 Mrs. George R. Merriam, Jr.
 Mrs. Charles F. Morgan
 Mrs. Equinn W. Munnell
 Mrs. Charles S. Neer, II
 Mrs. Carl T. Nelson
 Mrs. George A. Perera
 Mrs. Albert Rowland Perry, Jr.
 Mrs. John B. Price, Jr.

Mrs. John N. Schullinger
 Mrs. Rudolph N. Schullinger
 Mrs. Paul B. Sheldon
 Mrs. Joseph A. Silverman
 Mrs. Hamilton Southworth
 Mrs. Frank E. Stinchfield
 Mrs. Hardwick Stires
 Mrs. W. Duane Todd
 Mrs. Cornelius J. Tyson, Jr.

Mrs. Raymond L. Vande Wiele
 Mrs. Gilbert J. Vosburgh
 Mrs. John D. Warren
 Mrs. Richard Weil, III
 Mrs. Maynard C. Wheeler
 Mrs. Richard B. White
 Mrs. Richard L. White
 Mrs. Philip D. Wiedel
 Mrs. Bruce D. Williams

Associate Members

Mrs. Ned B. Ball
 Mrs. Dana T. Bartholomew
 Mrs. Arthur H. Blakemore
 Mrs. Thatcher M. Brown, Jr.
 Mrs. Howard G. Bruenn
 Mrs. Graham Clark
 Mrs. W. Van Alan Clark
 Mrs. Stuart W. Cosgriff
 Mrs. William J. Demorest
 Mrs. Alvin Devereux
 Mrs. Frederick A. Dewey
 Mrs. C. Dary Dunham
 Mrs. John H. Dunnington

Mrs. Cadvan O. Griffiths, Jr.
 Mrs. Harold D. Harvey
 Mrs. Leo R. Heiden
 Mrs. William Kirk
 Mrs. Yale Kneeland, Jr.
 Mrs. Richard J. Kossmann
 Mrs. I. L. Kramer
 Mrs. Samuel W. Lambert, Jr.
 Mrs. James R. Malm
 Mrs. David H. McAlpin
 Mrs. Robert B. McGraw
 Mrs. Charles A. McKendree
 Mrs. George G. Montgomery, Jr.

Mrs. Craven Nichols
 Mrs. Emanuel M. Papper
 Mrs. Milton R. Porter
 Mrs. Algernon B. Reese
 Mrs. Louis M. Rousselot
 Mrs. Fordyce B. St. John
 Mrs. Edward B. Self
 Mrs. Richard deL. Simmons
 Mrs. Richard J. Stock
 Mrs. Howard C. Taylor, Jr.
 Mrs. Frederick T. van Beuren
 Mrs. Herbert B. Wilcox, Jr.
 Mrs. George H. Wilkie

Junior Associate Members

Mrs. John W. Barnum
 Mrs. Robert G. Blabey, Jr.
 Mrs. John W. Espy

Mrs. John Gaines
 Mrs. Richard A. Kimball, Jr.
 Miss Deborah Van D. Kneeland

Mrs. Frank R. Smith
 Mrs. Hamilton Southworth, Jr.

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL

Mrs. Robert E. Carroll, *President*
 Mrs. Jarvis J. Slade, *2nd Vice-President*
 Mrs. Hugo A. Keim, *Secretary*

Mrs. George S. Johnston, Jr., *1st Vice-President*
 Mrs. William L. Hutton, *3rd Vice-President*
 Mrs. Walter H. Mann, Jr., *Treasurer*

Active Members

Mrs. Robert E. Carroll
 Mrs. Thomas H. Choate
 Mrs. Jane R. Condliffe
 Mrs. E. Allen Dennison
 Mrs. John R. Drexel, IV
 Mrs. Edward H. Gerry

Mrs. Charles B. Grosvenor
 Mrs. Keith Highet
 Mrs. Thomas Hitchcock
 Mrs. William L. Hutton
 Mrs. George S. Johnston, Jr.
 Mrs. Hugo A. Keim
 Mrs. William G. Maguire

Mrs. Walter H. Mann, Jr.
 Mrs. James O'Malley, Jr.
 Mrs. Willis L. M. Reese
 Mrs. Jarvis J. Slade
 Mrs. Prentice Talmage, Jr.
 Mrs. Donald Wallace

Associate Members

Mrs. William Cary
 Mrs. John H. Ewing
 Mrs. G. Ronald Furse
 Mrs. Reed Gillespie

Mrs. Alfred C. Harrison
 Mrs. A. Neil Lilley
 Mrs. Samuel Reed

Mrs. Bearns Smith
 Mrs. Peter Stephaich
 Mrs. John R. Stevenson
 Mrs. Caleb C. Whitaker

Honorary Members

Mrs. C. Suydam Cutting

Mrs. Sheldon Whitehouse

Members of the Corporation

The Presbyterian Hospital in the City of New York

Mrs. Edith M. Achilles
 Mrs. Charles E. Adams
 James Seybold Adams
 Hulbert S. Aldrich
 Malcolm P. Aldrich
 Winthrop W. Aldrich
 Robert B. Anderson
 Mrs. David L. Andrews
 James C. Auchincloss
 Mrs. Frederick R. Bailey
 Mrs. Munn Baker
 Mrs. Ned B. Ball
 Mrs. C. Redington Barrett
 Mrs. Dana T. Bartholomew
 Chauncey Belknap
 August Belmont
 Edward C. Bench
 John E. Bierwirth
 A. J. Binkert
 Mrs. Arthur H. Blakemore
 Roger M. Blough
 Mrs. Roger M. Blough
 Mrs. Neville J. Booker
 Mrs. Ralph H. Boots
 Nicholas F. Brady
 Mrs. B. Rionda Braga
 Edward C. Brewster
 Mrs. William Broadhurst
 Mrs. Robert Brooke
 John W. Brooks
 Mrs. Harold W. Brown
 Thatcher M. Brown, Jr.
 Mrs. Thatcher M. Brown, Jr.
 Mrs. Howard G. Bruenn
 Mrs. Alvin G. Brush
 Charles W. Buek
 Carter L. Burgess
 Mrs. Carter L. Burgess
 W. Randolph Burgess
 John S. Burke, Jr.
 Mrs. Thomas A. Burke
 Mrs. Francis H. Cabot, Jr.
 Mrs. Royall G. Cannaday
 Mrs. George A. Carden
 Mrs. William Cary
 Mrs. Carl Chadsey, Jr.
 Gilbert W. Chapman
 William H. Chisholm
 Thomas H. Choate
 Mrs. Thomas H. Choate
 Mrs. Graham Clark
 Howard L. Clark
 James M. Clark
 Mrs. W. Van Alan Clark
 Lucius D. Clay
 Mrs. Benjamin Coates
 Miss Dorothy Cockshaw
 Mrs. Bradley I. Collins
 Samuel Sloan Colt
 Mrs. Jane R. Condliffe

Mrs. Charles P. Cooper
 Mrs. H. S. Fenimore Cooper
 Roy F. Coppedge, Jr.
 Mrs. Ralph Cordiner
 Mrs. Stuart W. Cosgriff
 William Sheffield Cowles
 Cleo F. Craig
 Mrs. Howard R. Craig
 George A. Crocker
 Mrs. C. Suydam Cutting
 Mrs. Virgil G. Damon
 Mrs. Donald K. David
 Arthur H. Dean
 Mrs. William J. Demorest
 Mrs. E. Allen Dennison
 Mrs. Casimir deRham
 Mrs. Frederic F. deRham
 Mrs. Alvin Devereux
 Arthur Gerard DeVoe, M.D.
 Mrs. Arthur Gerard DeVoe
 Mrs. Frederick A. Dewey
 C. Douglas Dillon
 George S. Dillon
 Miss Ethel Donaghue
 Frederic G. Donner
 Mrs. Richard B. Duane, Jr.
 Miss Doris Duke
 Mrs. William D. Dunaway
 Mrs. C. Dary Dunham
 Mrs. John H. Dunnington
 Fredrick M. Eaton
 Mrs. Robert H. E. Elliott, Jr.
 Mrs. John H. Ewing
 James A. Farmer
 Mrs. Leo C. Fennelly
 Mrs. Jose M. Ferrer, Jr.
 Mrs. Hart Fessenden
 Mrs. Charles A. Flood
 Thomas C. Fogarty
 James W. Foley
 Mrs. William W. Foshay
 John M. Franklin
 Mrs. Henry Clay Frick, II
 G. Keith Funston
 Mrs. G. Ronald Furse
 Mrs. Edward Gardner, Jr.
 Artemus L. Gates
 Mrs. Edward H. Gerry
 John A. Gifford
 Mrs. Reed Gillespie
 Mrs. William H. Gorman, II
 George Lauder Greenway
 Mrs. Franklyn Griffin
 Mrs. Cadvan O. Griffiths, Jr.
 Peter Grimm
 Mrs. Robert S. Grinnell
 John S. Griswold
 W. E. S. Griswold, Jr.
 Mrs. Charles B. Grosvenor
 Mrs. Melvin M. Grumbach

Miss Ida Guerin
 Perry E. Hall
 Mrs. Lewis B. Harder
 Charles Barney Harding
 Mrs. Rebekah Harkness
 E. Roland Harriman
 Mrs. Alfred C. Harrison
 Mrs. Harold D. Harvey
 Mrs. Harry W. Havemeyer
 Mrs. Leo R. Heiden
 Harold H. Helm
 Mrs. Fred L. Heyes
 John A. Hill
 Mrs. William E. Hill
 Mrs. Thomas Hitchcock
 Mrs. Hilary H. Holmes
 Mrs. Herman L. Hoops
 Arthur Amory Houghton, Jr.
 Mrs. Calderon Howe
 Mrs. J. Taylor Howell
 Mrs. George H. Humphreys, II
 Mrs. William L. Hutton
 Mrs. Iredell W. Iglehart
 Mrs. George S. Johnston, Jr.
 Frederick R. Kappel
 Mrs. Francis L. Kellogg
 Mrs. Irving B. Kingsford, Jr.
 Miss Hope Kingsley
 Mrs. Walton P. Kingsley
 Mrs. John M. Kinney
 Mrs. Grayson Kirk
 Mrs. William Kirk
 Mrs. Yale Kneeland, Jr.
 Lawrence C. Kolb, M.D.
 Mrs. Lawrence C. Kolb
 Mrs. Richard J. Kossmann
 Mrs. I. L. Kramer
 Mrs. Rush Harrison Kress
 Mrs. Samuel W. Lambert, Jr.
 Mrs. John G. Leness
 Mrs. Francis A. L'Esperance, Jr.
 Mrs. Robert James Lewis
 Mrs. A. Neil Lilley
 Augustus C. Long
 Alfred L. Loomis, Jr.
 Robert A. Lovett
 Ranald H. Macdonald
 Mrs. James C. Mackenzie
 Mrs. James McCosh Magie
 Mrs. William G. Maguire
 Mrs. James R. Malm
 Mrs. Bradley Manice
 Mrs. James C. Manny
 Paul A. Marks, M.D.
 Mrs. Richard L. Masland
 Birny Mason, Jr.
 Mrs. Rollo J. Masselink
 Mrs. Allen F. Maulsby
 Mrs. Malcolm H. McAllister
 David H. McAlpin

Mrs. David H. McAlpin
 Mrs. Howard McAteer
 Mrs. Robert B. McGraw
 Mrs. Charles A. McKendree
 Mrs. Joseph V. McMullan
 Samuel W. Meek
 Mrs. Luiz Meirellas
 H. Houston Merritt, M.D.
 Mrs. H. Houston Merritt
 Mrs. Manton B. Metcalf, Jr.
 Mrs. Clifford W. Michel
 Mrs. Richard Migel
 Thomas P. F. Milbank
 Miss Dorothy Mills
 Mrs. Keith Moffat
 Mrs. George G. Montgomery, Jr.
 Mrs. Robert Montgomery
 Mrs. Rodman B. Montgomery
 Mrs. Charles F. Morgan
 Charles G. Mortimer
 Mrs. J. Malcolm Muir
 Robert H. Mulreany
 Milton C. Mumford
 Mrs. Orson Munn
 Charles S. Munson
 Mrs. Charles S. Munson
 Charles S. Munson, Jr.
 Robert D. Murphy
 Mrs. Charles S. Neer, II
 Mrs. Carl T. Nelson
 Quigg Newton
 Mrs. Craven Nichols
 Albert L. Nickerson
 Mrs. James O'Malley, Jr.
 Mrs. Grover O'Neill
 Mrs. Grover O'Neill, Jr.
 Mrs. William S. Paley
 Mrs. Emanuel M. Papper
 Henry Parish, 2nd
 Richard K. Paynter, Jr.
 Charles S. Payson
 Mrs. George A. Perera
 Mrs. Felix R. Pierot
 Francis T. P. Plimpton
 Mrs. J. Lawrence Pool
 J. Lenox Porter
 Mrs. Milton R. Porter
 Percy R. Pyne, III

Charles A. Ragan, Jr., M.D.
 M. J. Rathbone
 Phillip D. Reed
 Mrs. Samuel Reed
 Mrs. Algernon B. Reese
 Mrs. Willis L. M. Reese
 Mrs. George A. Rentschler
 Mrs. John H. Reynolds
 Mrs. H. McLeod Riggins
 Mrs. Henry A. Riley
 Charles S. Robertson
 H. I. Romnes
 R. Peter Rose
 Mrs. R. Peter Rose
 Mrs. Walter N. Rothschild
 Mrs. Louis M. Rousselot
 Mrs. Fortune Peter Ryan
 Mrs. Fordyce B. St. John
 Mrs. Thomas V. Santulli
 Mrs. John E. Scarff
 Mrs. Edward B. Schlesinger
 Mrs. John N. Schullinger
 Mrs. Rudolph N. Schullinger
 Frederick A. O. Schwarz
 Mrs. Frederick A. O. Schwarz
 Mrs. Edward B. Self
 Dorrance Sexton
 Mrs. Paul B. Sheldon
 Mrs. Richard deL. Simmons
 Mrs. Jarvis J. Slade
 Mrs. John Sloane
 Mrs. Bearns Smith
 Mrs. Hamilton Southworth
 Mrs. George A. Spater
 Charles M. Spofford
 Mrs. Peter Stephaich
 John P. Stevens, Jr.
 Mrs. John R. Stevenson
 William E. Stevenson
 Mrs. William E. Stevenson
 Edward Ellsworth Stewart
 Charles L. Stillman
 Frank E. Stinchfield, M.D.
 Mrs. Frank E. Stinchfield
 Mrs. Hardwick Stires
 Mrs. Richard J. Stock
 Mrs. John Hoyt Stookey
 Benjamin Strong
 Mrs. Charles E. Stroud

Frederick Sturges, Jr.
 Charles H. Symington, Jr.
 Mrs. Prentice Talmage, Jr.
 Mrs. Henry C. Taylor
 Mrs. Howard C. Taylor, Jr.
 W. R. K. Taylor, Jr.
 Mrs. George G. Tenney
 Joseph A. Thomas
 Mrs. William Thompson
 Mrs. John S. Tilney
 Mrs. W. Duane Todd
 Kenneth C. Towe
 John C. Traphagen
 Mrs. K. Herluf Trudso
 Mrs. Carll Tucker
 Mrs. Carll Tucker, Jr.
 Mrs. Cornelius J. Tyson, Jr.
 Cyrus R. Vance
 Milton L. Van Slyck
 Guido F. Verbeck, Jr.
 Mrs. James P. Vogel
 Mrs. Anton E. Walbridge
 Mrs. Bayard Walker
 James W. Walker
 Mrs. Donald L. Wallace
 Arthur K. Watson
 Lowell P. Weicker
 Mrs. John L. Weinberg
 Sidney J. Weinberg, Jr.
 Mrs. Sidney J. Weinberg, Jr.
 Edwin L. Weisl, Jr.
 Mrs. Andrew C. Wetmore
 Mrs. Maynard C. Wheeler
 Morgan Dix Wheelock
 Mrs. Caleb C. Whitaker
 Mrs. Richard B. White
 Mrs. Richard L. White
 Mrs. Sheldon Whitehouse
 Mrs. Philip D. Wiedel
 Mrs. Herbert B. Wilcox, Jr.
 Mrs. George H. Wilkie
 Douglas Williams
 Mrs. Douglas Williams
 Mrs. Earl Kress Williams
 Robert Winthrop
 Mrs. Willis D. Wood
 Charles B. Wrightsman
 John M. Young

Administrative Staff

The Presbyterian Hospital in the City of New York

A. J. BINKERT

President

R. N. KERST

Vice President (Administration)

Assistant Secretary-Treasurer

C. DOUGLAS AUTY

Assistant Vice President

Personnel

MILTON R. PORTER, M.D.

Assistant Vice President

MARY I. CRAWFORD, R.N.

Director of Nursing

JOSEPH E. SNYDER, M.D.

Assistant Vice President

ROBERT H. E. ELLIOTT, JR., M.D.

Assistant Vice President

Special Projects (Nursing)

Vanderbilt Clinic and Other Services

G. R. MASTEN

Assistant Vice President

Nonprofessional Services

CARL R. WISE, M.D.

Assistant Vice President

Professional Services to Patients

Dean Calvert

Administrative Assistant

Food Service and Housekeeping Department

R. N. Ott

Assistant Treasurer

Eugene T. Cleary

Administrative Assistant

Projects and Operations and Maintenance

N. L. Peters

Comptroller

C. J. Orlando

Assistant Treasurer

Winfred Van Atta

Director, Public Interest

Mary E. Windrow, R.N.

Director, Nursing Service

Professional Staff

The Presbyterian Hospital in the City of New York

Professional Staff

Consultants

J. Burns Amberson, M.D. *Medicine*
 George C. Andrews, M.D. *Dermatology*
 Dana W. Atchley, M.D. *Medicine*
 Alvan L. Barach, M.D. *Medicine*
 Leslie P. Barker, M.D. *Dermatology*
 Viola W. Bernard, M.D. *Psychiatry*
 Gordon M. Bruce, M.D. *Ophthalmology*
 Howard G. Bruenn, M.D. *Medicine*
 E. Everett Bunzel, M.D. *Obstetrics and Gynecology*
 John Caffey, M.D. *Radiology*
 Mather Cleveland, M.D. *Orthopedic Surgery*
 André F. Cournand, M.D. *Medicine*
 Fritz J. Cramer, M.D. *Neurological Surgery*
 George E. Daniels, M.D. *Psychiatry*
 D. Anthony D'Esopo, M.D. *Obstetrics and Gynecology*
 John H. Dunnington, M.D. *Ophthalmology*
 Robert H. E. Elliott, Jr., M.D. *Surgery*
 George W. Fish, M.D. *Urology*
 Charles A. Flood, M.D. *Medicine*
 Angus M. Frantz, M.D. *Neurology*
 Ross Golden, M.D. *Radiology*
 Paul Gross, M.D. *Dermatology*
 A. David Gurewitsch, M.D. *Rehabilitation Medicine*
 Cushman D. Haagensen, M.D. *Surgery*
 John M. Hanford, M.D. *Surgery*
 Harold D. Harvey, M.D. *Surgery*
 Paul F. A. Hoefler, M.D. *Neurology*
 George H. Humphreys, II, M.D. *Surgery*
 Harold W. Jacob, M.D. *Radiology*
 William S. Langford, M.D. *Pediatrics*
 Alfred G. Langmann, M.D. *Pediatrics*
 Maurice Lenz, M.D. *Radiology*

Robert L. Levy, M.D. *Medicine*
 Robert F. Loeb, M.D. *Medicine*
 Rustin McIntosh, M.D. *Pediatrics*
 H. Houston Merritt, M.D. *Neurology*
 J. Lowry Miller, M.D. *Dermatology*
 Richmond L. Moore, M.D. *Surgery*
 Carl R. Oman, D.D.S. *Dentistry*
 †William Barclay Parsons, M.D. *Surgery*
 Charles A. Perera, M.D. *Ophthalmology*
 Phillip Polatin, M.D. *Psychiatry*
 J. Lawrence Pool, M.D. *Neurological Surgery*
 Algernon B. Reese, M.D. *Ophthalmology*
 †Dickinson W. Richards, M.D. *Medicine*
 Harry M. Rose, M.D. *Medicine*
 Fordyce B. St. John, M.D. *Surgery*
 John E. Scarff, M.D. *Neurological Surgery*
 Albin R. Seidel, D.M.D. *Dentistry*
 Lawrence W. Sloan, M.D. *Surgery*
 Alan DeForest Smith, M.D. *Orthopedic Surgery*
 Gilbert P. Smith, D.D.S. *Dentistry*
 William B. Snow, M.D. *Rehabilitation Medicine*
 Hamilton Southworth, M.D. *Medicine*
 Howard C. Taylor, Jr., M.D. *Obstetrics and Gynecology*
 Royal C. Van Etten, M.D. *Obstetrics and Gynecology*
 Benjamin P. Watson, M.D. *Obstetrics and Gynecology*
 Jerome P. Webster, M.D. *Surgery*
 Maynard C. Wheeler, M.D. *Ophthalmology*
 Sigmund L. Wilens, M.D. *Pathology*
 Abner Wolf, M.D. *Pathology*
 DeGraaf Woodman, M.D. *Otolaryngology*
 Robert H. Wylie, M.D. *Surgery*

Anesthesiology Service

DIRECTOR OF SERVICE

Shih-Hsun Ngai, M.D.

ATTENDING ANESTHESIOLOGISTS

Leonard Brand, M.D.
 Robert M. Epstein, M.D.
 Edgar C. Hanks, M.D.
 Ronald L. Katz, M.D.
 Lester C. Mark, M.D.
 Gabriel G. Nahas, M.D.
 Herbert Rackow, M.D.
 Ernest Salanitro, M.D.
 Herman Schwartz, M.D.
 Stuart F. Sullivan, M.D.

ASSOCIATE ATTENDING

ANESTHESIOLOGISTS

Mieczyslaw Finster, M.D.
 Lynne T. Grcenc, M.D.
 Joannes H. Karis, M.D.
 Richard W. Patterson, M.D.
 Paul J. Poppers, M.D.
 Charles E. Wolf, M.D.

ASSISTANT ATTENDING

ANESTHESIOLOGISTS

Dorothy A. Black, M.D.
 Kathryn A. W. Cozine, M.D.
 Robert T. Donham, M.D.
 Carolyn P. Greenberg, M.D.
 Allen I. Hyman, M.D.
 Hoshang Jal Khambatta, M.D.
 Vance Lauderdale, Jr., M.D.
 Krishan Malik, M.D.
 Shirley J. Markee, M.D.
 *Richard S. Matteo, M.D.
 Jordan Miller, M.D.
 Eugene J. Pantuck, M.D.
 Hilda Pedersen, M.D.
 Daniel M. Pino, M.D.
 Alan N. Rachleff, M.D.
 J. Gilbert Stone, M.D.

ASSISTANT ANESTHESIOLOGISTS

Gerald L. Feinberg, M.D.
 Ernst Heilbrunn, M.D.
 Anthony J. Salvatore, M.D.
 Hong Chul Yoon, M.D.

ASSISTANT RESIDENTS

Nelly F. Abadir, M.D.
 Sami A. Abadir, M.D.
 Jasjit B. Atwal, M.D.
 Jonathan L. Benumof, M.D.
 Samir B. Botros, M.D.
 Octavio Camasura, M.D.
 William G. Chan, M.D.
 Tehong T. Chen, M.D.
 William T. Delaney, M.D.
 Francisco S. DeLeon, M.D.
 Robert A. Fischer, M.D.
 Erlinda S. Gambito, M.D.
 Richard N. Heyendal, M.D.
 Shih-piao Hsu, M.D.
 Philip M. Iorio, M.D.
 Chien-Kuo Kao, M.D.
 Alexander R. Kehayes, M.D.
 Mohan H. Kulkarni, M.D.
 Saidel Laine, M.D.
 Hang-Chiang Lee, M.D.
 Jai-Hoan Lee, M.D.
 Guillermo Leon, M.D.
 Maylinda Mancao, M.D.

† Deceased

* Leave of Absence

ASSISTANT RESIDENTS (*continued*)

J. A. Jeevendra Martyn, M.D.
 Corazon Maurrasse, M.D.
 Ludmila Z. Mellups, M.D.
 Michael A. Micavich, M.D.
 Ahmed A. Mohsen, M.D.
 Ali H. Nagai, M.D.
 Tae Hee Oh, M.D.
 Habib A. Oscoff, M.D.
 Leila M. Pang, M.D.
 Narendra Parson, M.D.
 Carmelino C. Payumo, M.D.
 Estella K. Pua, M.D.
 Rene R. Rigal-Lizardi, M.D.
 Rosaly I. Saba, M.D.
 Edwina S. Sia-Kho, M.D.
 Joanna Treder, M.D.
 Lubos Triner, M.D.
 Sidney O. Veitch, M.D.
 Carmen M. Villaluz, M.D.
 Rey O. Villanueva, M.D.
 Il Sung Won, M.D.
 Jen Tien Wung, M.D.
 Chen-Ping Yang, M.D.
 Hong C. Yoon, M.D.
 Reda A. Zakhary, M.D.

VISITING FELLOWS

Ming Chuan Chiou, M.D.
 Shik-Kei Chuk, M.D.
 Atsuo Fukunaga, M.D.
 Peter E. Horowitz, M.D.
 Roger Lallemand, M.D.
 Jeany Pierre-Louis, M.D.
 David H. Sprague, M.D.
 Norman J. Starr, M.D.
 Joseph C. Yang, M.D.

Dental Service

DIRECTOR OF SERVICE

Melvin L. Moss, D.D.S.

ATTENDING DENTAL SURGEONS

Edward A. Cain, Jr., D.D.S.
 Nicholas A. DiSalvo, D.D.S.
 Robert Gottsegen, D.D.S.
 John J. Lucca, D.D.S.
 George L. O'Grady, D.D.S.
 Solomon N. Rosenstein, D.D.S.
 Edward V. Zegarelli, D.D.S.

ASSOCIATE ATTENDING DENTAL SURGEONS

†Lester R. Cahn, D.D.S.
 Victor S. Caronia, D.D.S.
 Joseph A. Cuttita, D.D.S.
 Louis J. Loscalzo, D.D.S.
 Irwin D. Mandel, D.D.S.
 Louis Mandel, D.D.S.
 Joseph J. Marbach, D.D.S.
 George A. Minervini, D.D.S.
 Ennio L. Uccellani, D.D.S.

†Inactive

ASSISTANT ATTENDING DENTAL SURGEONS

Jerome Bartwink, D.D.S.
 Sebastian A. Bruno, D.D.S.
 Stanislaw H. Brzustowicz, D.D.S.
 Jack Budowsky, D.D.S.
 Kourken A. Daglian, D.D.S.
 Anthony L. DiMango, D.D.S.
 Martin J. Fields, D.D.S.
 Sidney L. Horowitz, M.D., D.D.S.
 Bert Klatskin, D.D.S.
 Austin H. Kutscher, D.D.S.
 Eugene P. LaSota, D.D.S.
 Laurence J. Levine, D.D.S.
 John Kirk Lind, D.D.S.
 Joseph Luban, D.D.S.
 Michael Z. Marder, D.D.S.
 Henry I. Nahoum, D.D.S.
 Irving J. Naidorf, D.D.S.
 Arnold Rosenberg, D.D.S.
 Fred Rothenberg, D.D.S.
 Daniel D. Schube, D.D.S.
 Murray Schwartz, D.D.S.
 Steven S. Scrivani, D.D.S.
 Boaz M. Shattan, D.D.S.
 Morton J. Stern, D.D.S.

Dermatology Service

DIRECTOR OF SERVICE

Carl T. Nelson, M.D.

ATTENDING DERMATOLOGISTS

Irving Abrahams, M.D.
 †Helen O. Curth, M.D.
 Anthony N. Domonkos, M.D.
 Jack Eisert, M.D.
 Saul L. Sanders, M.D.
 Lewis Shapiro, M.D.
 Meyer H. Slatkin, M.D.
 Richard A. Walzer, M.D.
 Alexander W. Young, Jr., M.D.

ASSISTANT ATTENDING DERMATOLOGISTS

William G. Atwood, M.D.
 Einar A. Juhlin, M.D.
 Theodore A. Labow, M.D.
 Peter C. Lombardo, M.D.

ATTENDING DERMATOLOGISTS

VANDERBILT CLINIC

Marvin Brodey, M.D.
 †William Curth, M.D.
 Henry L. Hines, M.D.
 †Max Liebmman, M.D.

ASSISTANT ATTENDING DERMATOLOGISTS VANDERBILT CLINIC

Burton S. Koplon, M.D.
 Joseph A. Penner, M.D.
 Jack H. Rozen, M.D.
 Joseph S. Shapiro, M.D.
 Hilda G. Straker, M.D.
 Eugene W. Sweeney, M.D.
 K. William Waterson, Jr., M.D.

ASSISTANT DERMATOLOGISTS VANDERBILT CLINIC

William R. Barbee, M.D.
 Vincent S. Beltrani, M.D.
 Elaine V. DiGrande, M.D.
 Loren E. Golitz, M.D.
 †Marie Karelitz-Karry, M.D.
 David Sibulkin, M.D.
 Eva B. Stahl, M.D.

RESIDENTS

Jeffrey J. Kroll, M.D.
 Frederic R. Rosenberg, M.D.

ASSISTANT RESIDENTS

Sidney A. Hochman, M.D.
 Mark S. Lichtenberg, M.D.
 Gary Salenger, M.D.

VISITING FELLOWS

John R. Reeves, M.D.
 Lawrence T. Wagers, M.D.
 Constance Wong, M.D.
 Jonathan Zizmor, M.D.

Medical Service

DIRECTOR OF SERVICE

Charles A. Ragan, Jr., M.D.

ATTENDING PHYSICIANS

Henry Aranow, Jr., M.D.
 Stanley E. Bradley, M.D.
 Robert E. Canfield, M.D.
 Felix E. Demartini, M.D.
 M. Irené Ferrer, M.D.
 Harry W. Fritts, Jr., M.D.
 DeWitt S. Goodman, M.D.
 Rejane M. Harvey, M.D.
 Robert S. Krooth, M.D.
 John H. Laragh, M.D.
 Paul A. Marks, M.D.
 Hymie L. Nossel, M.D.
 Elliott F. Osserman, M.D.
 Richard A. Rifkind, M.D.
 John V. Taggart, M.D.
 Donald F. Tapley, M.D.
 Gerard M. Turino, M.D.
 Sidney C. Werner, M.D.
 Arthur R. Wertheim, M.D.

ASSOCIATE ATTENDING PHYSICIANS

Arthur Bank, M.D.
 John T. Bigger, Jr., M.D.
 Vincent P. Butler, Jr., M.D.
 Paul J. Cannon, M.D.
 †George A. Carden, M.D.
 Nicholas P. Christy, M.D.
 Stuart W. Cosgriff, M.D.
 Edward E. Fischel, M.D.
 Shirley C. Fisk, M.D.
 Andrew G. Frantz, M.D.

ASSOCIATE ATTENDING PHYSICIANS
(continued)

David J. Gocke, M.D.
 Albert W. Grokoest, M.D.
 Donald A. Holub, M.D.
 George A. Hyman, M.D.
 Julia M. Jones, M.D.
 Abbie I. Knowlton, M.D.
 John S. Kovach, M.D.
 Robert A. Kritzer, M.D.
 Albert R. Lamb, Jr., M.D.
 †Samuel W. Lambert, Jr., M.D.
 Edgar Leifer, M.D.
 James L. Leland, M.D.
 E. Carwile LeRoy, M.D.
 John Lindenbaum, M.D.
 John H. McClement, M.D.
 George H. McCormack, Jr., M.D.
 George W. Melcher, Jr., M.D.
 Jay I. Meltzer, M.D.
 †Arthur E. Neergaard, M.D.
 Harold C. Neu, M.D.
 Robert P. Noble, M.D.
 Kermit L. Pines, M.D.
 †Bertram J. Sanger, M.D.
 †Paul B. Sheldon, M.D.
 †Martin DeForest Smith, M.D.
 Richard J. Stock, M.D.
 Gerald E. Thomson, M.D.
 Theodore B. Van Itallie, M.D.
 Herbert B. Wilcox, Jr., M.D.
 John A. Wood, M.D.

ASSISTANT ATTENDING PHYSICIANS

Casco Alston, M.D.
 Helen M. Anderson, M.D.
 Leslie P. Baer, M.D.
 John F. Bertles, M.D.
 Hylan A. Bickerman, M.D.
 Alfred E. Brewer, M.D.
 John L. Buchanan, M.D.
 John O. Burris, M.D.
 Peter R. B. Caldwell, M.D.
 Robert B. Case, M.D.
 Michael H. Cohen, M.D.
 Henry Colcher, M.D.
 John T. Connell, M.D.
 Clarence J. D'Alton, M.D.
 John Van B. Dean, M.D.
 Robert H. DeBellis, M.D.
 Richard B. Duane, Jr., M.D.
 Yale Enson, M.D.
 Charles D. Faverio, M.D.
 Michael H. Gricco, M.D.
 Lionel Grossbard, M.D.
 Wendell B. Hatfield, M.D.
 Wylie Hembree, M.D.
 George C. Hennig, M.D.
 Peter R. Holt, M.D.
 Daniel L. Larson, M.D.
 Roger L. Lerner, M.D.
 John N. Loeb, M.D.
 William P. Lovejoy, M.D.
 William M. Manger, M.D.

James A. L. Mathers, M.D.
 David J. McConnell, M.D.
 Thomas Q. Morris, M.D.
 Jane H. Morse, M.D.
 Hans W. Neuberger, M.D.
 Gerald B. Phillips, M.D.
 Richard Rivlin, M.D.
 Dudley F. Rochester, M.D.
 Norton S. Rosensweig, M.D.
 Donald H. Schmidt, M.D.
 Peter E. Schrag, M.D.
 Howard B. Shookhoff, M.D.
 Frank R. Smith, M.D.

*William H. Stearns, M.D.
 Jeffrey A. Stein, M.D.
 Alfred Steiner, M.D.
 Charles Steiner, M.D.
 Kenneth Sterling, M.D.
 Joseph G. Sweeting, M.D.
 Henry M. Thomas, III, M.D.
 Cornelius J. Tyson, M.D.
 I. Bernard Weinstein, M.D.
 †Paul Wermer, M.D.
 Earl A. Wheaton, Jr., M.D.
 Robert T. Whitlock, M.D.
 Carl R. Wise, M.D.

ASSISTANT PHYSICIANS

†Alice T. Baker, M.D.
 Eli Bauman, M.D.
 Ralph S. Blume, M.D.
 Geraldine P. Bradley, M.D.
 George C. Branche, Jr., M.D.
 Norma Mai Tsen Wang Braun, M.D.
 John S. Britten, M.D.
 Marcia B. Bull, M.D.
 M. Edwina Campbell, M.D.
 †Henry P. Colmore, M.D.
 Neal J. Conan, M.D.
 James A. Coss, Jr., M.D.
 †Lawrence H. Cotter, M.D.
 James J. Coyne, M.D.
 James K. Cunningham, M.D.
 Paul Cushman, M.D.
 Dorothy A. Erickson, M.D.
 Dorothy Estes, M.D.
 Mehdi Farhangi, M.D.
 Lloyd C. Fisher, M.D.
 Claudio Gerbi, M.D.
 Elsa-Grace Vonna Giardina, M.D.
 Jonas M. Goldstone, M.D.
 Robert H. Heissenbuttel, M.D.
 Joseph Heller, M.D.
 James A. Hogan, M.D.
 Ginette B. Jacob, M.D.
 Paul K. Johnson, M.D.
 Margaret M. Kilcoyne, M.D.
 Paul Killian, M.D.
 Arnold L. Lisio, M.D.
 Daniel L. Macken, M.D.
 Pier L. Mancusi-Ungaro, M.D.
 Kenneth A. McClane, M.D.
 †Isidor Mufson, M.D.
 Marc E. Newberg, M.D.

Carmen Ortiz-Neu, M.D.
 Richard N. Pierson, Jr., M.D.
 F. Xavier Pi-Sunyer, M.D.
 Jane Pitt, M.D.
 Marshall P. Primack, M.D.
 Edith B. Reilly, M.D.
 Stanford A. Roman, Jr., M.D.
 Joyce C. Shaver, M.D.
 Lewis M. Slater, M.D.
 Arthur I. Snyder, M.D.
 Julio E. Sotelo, M.D.
 Melvin B. Weiss, M.D.

ATTENDING PHYSICIANS
VANDERBILT CLINIC

†Louis Schneider, M.D.
 †Max Soley, M.D.

ASSISTANT ATTENDING PHYSICIANS
VANDERBILT CLINIC

Stewart F. Alexander, M.D.
 John T. Beaty, M.D.
 †Hans Kaunitz, M.D.
 Cristobal A. Vicens, M.D.

ASSISTANT PHYSICIANS
VANDERBILT CLINIC

Richard P. Ames, M.D.
 Howard J. Barnum, M.D.
 Gustav J. Beck, M.D.
 Alfred Becker, M.D.
 †Winifred Bronson, M.D.
 Gilbert R. Cherrick, M.D.
 Daniel S. J. Choy, M.D.
 Paul J. Chrzanowski, M.D.
 John M. Daley, M.D.
 †Erna S. Enderle, M.D.
 Arthur Feinberg, M.D.
 Helen-Ann Garcia, M.D.
 Irwin Goldstein, M.D.
 Lonnie B. Hanaauer, M.D.
 Ralph J. Herz, Jr., M.D.
 Elias M. Kaimakliotis, M.D.
 Constantine P. Ladopoulos, M.D.
 †Henry Lax, M.D.
 Arthur J. Lennon, Jr., M.D.
 Marvin M. Lipman, M.D.
 Mato L. Marinovich, M.D.
 Clayton L. Natta, M.D.
 Eduardo R. Pons, Jr., M.D.
 Milovan T. Rakic, M.D.
 Morris R. Rapoport, M.D.
 Stephen R. Rheingold, M.D.
 John M. Rodgers, M.D.
 Robert B. Roven, M.D.
 Nathaniel Selleck, M.D.
 Theodore J. Stahl, M.D.
 Helen Van Alstine, M.D.
 Ronald Wallach, M.D.
 Stuart H. Young, M.D.

CHIEF PODIATRIST

†Michael J. Petti, Pod.D.

† Inactive

* Leave of Absence

ODIATRISTS

Bernard Rosenstein, Pod.D.
John J. Slevin, Pod.D.
Harold H. Whitney, Pod.D.

ESIDENTS

William M. Lee, M.D.
William A. MacLean, M.D.

SSISTANT RESIDENTS

John D. Baker, M.D.
Hugo V. Bejar, M.D.
Robert A. Blackman, M.D.
Richard C. Boucher, Jr., M.D.
David K. Blood, M.D.
Jeffrey M. Brensilver, M.D.
Leland G. Dobbs, M.D.
Leon H. Dragon, M.D.
Ronald Drusin, M.D.
Malcolm E. Edwards, M.D.
Arthur E. Feinerman, M.D.
Paul A. Friedman, M.D.
Thomas J. Garrett, M.D.
Edward R. George, M.D.
Stephen J. Gunther, M.D.
Byron W. Gustin, M.D.
Wesley P. Hager, M.D.
I. Craig Henderson, M.D.
Thomas P. Jacobs, M.D.
Lynne Johnson, M.D.
Terry Langer, M.D.
Walter B. Lundberg, M.D.
Burton Mayrowetz, M.D.
John S. McDougal, M.D.
M. Edward Medof, M.D.
Gilbert H. Mudge, Jr., M.D.
John H. Newman, M.D.
Martin Paris, M.D.
Michael F. Parry, M.D.
Michael Pine, M.D.
John E. Postley, Jr., M.D.
Kenneth M. Prager, M.D.
Paul G. Rausch, M.D.
James A. Reiffel, M.D.
Caroline Riely, M.D.
Alan L. Saroff, M.D.
Robert A. Schulze, Jr., M.D.
Stephen Schreibman, M.D.
Jane S. Sillman, M.D.
Carol D. Silver, M.D.
Ethel S. Siris, M.D.
Robert M. Stein, M.D.
James L. Taylor, M.D.
Richard E. Thorner, M.D.
Ramon Velez, M.D.
Jack B. Weissman, M.D.
Joseph M. Wildman, M.D.
Gail S. Williams, M.D.
Thomas M. Woodcock, M.D.

INTERNS

Gerald B. Appel, M.D.
Alan Berkman, M.D.
Conrad B. Blum, M.D.

† Inactive
* Leave of Absence

Michael A. Bush, M.D.
Catherine F. Cabot, M.D.
Robert H. Carlson, M.D.
Philip Cohen, M.D.
Ann P. D'Adamo, M.D.
Robert J. Dresdale, M.D.
James P. Halper, M.D.
Scott M. Hammer, M.D.
Peter Hasselbacher, M.D.
Garner T. Hauptert, M.D.
Bruce E. Kessler, M.D.
George N. McNeil, Jr., M.D.
Stephen J. Pancoast, M.D.
Benjamin M. Romney, M.D.
Sara G. Rosenthal, M.D.
Alan H. Seplowitz, M.D.
Alfred Singer, M.D.
Alan C. Swann, M.D.
Joseph M. Vinci, M.D.
Jack Zyroff, M.D.

VISITING FELLOWS

William G. Baxt, M.D.
Charles E. Blair, M.D.
Avrum Z. Bluming, M.D.
Hans R. Brunner, M.D.
Fritz R. Buhler, M.D.
David B. Case, M.D.
Marvin C. Cooper, M.D.
Lois Dow, M.D.
Ray Fleischman, M.D.
Glenda J. Garvey, M.D.
Haralambos Gavras, M.D.
Irene Gavras, M.D.
Harold German, M.D.
Theodora L. Gongaware, M.D.
Joanna Haas, M.D.
Kazim Husain, M.D.
Musa K. Husain, M.D.
Richard S. Irwin, M.D.
Janet A. Lan, M.D.
Jorge Lopez-Ovejero, M.D.
George Mallis, M.D.
John E. McWhorter, M.D.
Carlos E. Menendez, M.D.
Gordon E. Noel, M.D.
Austin M. Pattner, M.D.
John F. Pezzimenti, M.D.
Ghulam D. Quereshi, M.D.
Bernadette Rafferstein, M.D.
Robert J. Reza, M.D.
Han Kyu Suh, M.D.
E. Darracott Vaughan, Jr., M.D.
Ian M. Yudelma, M.D.

Microbiology**MICROBIOLOGISTS**

Paul D. Ellner, Ph.D.
Elvin A. Kabat, Ph.D.

ASSOCIATE ATTENDING MICROBIOLOGIST

Councilman Morgan, M.D.

Neurological Surgery Service
(Neurological Institute)**ACTING DIRECTOR OF SERVICE**

Lester A. Mount, M.D.

ATTENDING NEUROLOGICAL SURGEONS

James W. Correll, M.D.
Edward B. Schlesinger, M.D.

ASSOCIATE ATTENDING NEUROLOGICAL SURGEONS

Thomas J. Bridges, Jr., M.D.
Edgar M. Housepian, M.D.

ASSISTANT ATTENDING NEUROLOGICAL SURGEONS

Peter W. Carmel, M.D.
James G. McMurtry, III, M.D.
W. Jost Michelsen, M.D.

ASSISTANT NEUROLOGICAL SURGEON

Richard B. Raynor, M.D.

ASSISTANT NEUROLOGICAL SURGEON, VANDERBILT CLINIC

James E. Finn, M.D.

RESIDENTS

Marshall L. Grode, M.D.
Richard D. Penn, M.D.
Timothy B. Scarff, M.D.

ASSISTANT RESIDENTS

Joao L. Antunes, M.D.
Eugene A. Balis, M.D.
Marx G. Bowens, Jr., M.D.
Martin B. Camins, M.D.
Roger W. Countee, M.D.
Howard H. Kaufman, M.D.
Donald Quest, M.D.
Michael Salcman, M.D.
Nicholas Szabo, M.D.

Neurology Service

(Neurological Institute)

DIRECTOR OF SERVICE

Richard L. Masland, M.D.

ATTENDING NEUROLOGISTS

*Sidney Carter, M.D.
*Roger C. Duvoisin, M.D.
Arnold P. Friedman, M.D.
Sid Gilman, M.D.
Eli S. Goldensohn, M.D.
Donald H. Harter, M.D.
†John McD. McKinney, M.D.
Daniel Sciarra, M.D.
Carmine T. Vicale, M.D.
Melvin D. Yahr, M.D.

ASSOCIATE ATTENDING NEUROLOGISTS

Joseph G. Chusid, M.D.
 Abe M. Chutorian, M.D.
 Lucien J. Cote, M.D.
 Robert A. deNapoli, M.D.
 †Stanley M. Dillenberg, M.D.
 †Alfred Gallinek, M.D.
 Arnold P. Gold, M.D.
 James F. Hammill, M.D.
 Stanley Lesse, M.D.
 Robert E. Lovelace, M.D.
 Niels L. Low, M.D.
 †Joseph Moldaver, M.D.
 Joseph L. O'Brien, M.D.
 †Samuel Reback, M.D.
 Ralph W. Richter, M.D.
 Margaret R. Seiden, M.D.
 †Maximilian Silbermann, M.D.
 Samuel F. Thomas, M.D.
 Hyman G. Weitzen, M.D.

ASSISTANT ATTENDING NEUROLOGISTS

Robert E. Barrett, M.D.
 Frank K. Boschenstein, M.D.
 Carl W. Braun, M.D.
 Jason W. Brown, M.D.
 John C. M. Brust, Jr., M.D.
 Malcolm B. Carpenter, M.D.
 Sidney M. Cohen, M.D.
 James F. Culleton, M.D.
 Richard F. Defendini, M.D.
 M. Richard Koenigsberger, M.D.
 †Raul Pietri, M.D.
 David L. Sagman, M.D.
 Myrna J. Schear, M.D.
 Earl A. Zimmerman, M.D.

ASSISTANT NEUROLOGISTS

Dennis G. Brown, M.D.
 Martha B. Denckla, M.D.
 Robert A. Esser, M.D.
 Eugenia Gamboa, M.D.
 Edward J. Hart, M.D.
 Linda D. Lewis, M.D.
 Sang C. Rhee, M.D.
 Michael L. Sananman, M.D.
 Phillip Su, M.D.

ASSISTANT ATTENDING NEUROLOGISTS
VANDERBILT CLINIC

†William R. Dyer, M.D.
 Geoffrey F. Osler, M.D.

ASSISTANT NEUROLOGIST
VANDERBILT CLINIC

Donald R. Hirsch, M.D.

RESIDENTS

Patrick A. Hogan, M.D.
 Leon Weisberg, M.D.

ASSISTANT RESIDENTS

Adam Bender, M.D.
 Richard A. Berenberg, M.D.
 Arthur S. Brown, M.D.
 Louis W. Catalano, M.D.

Jonathan Charney, M.D.
 Pamela Chavis, M.D.
 William P. Duggan, M.D.
 Michael L. Gruber, M.D.
 Lewis L. Hamilton, M.D.
 Fernando Herrero, M.D.
 Robert Holtzman, M.D.
 Gordon J. Kirschberg, M.D.
 Donald Kobrin, M.D.
 Stanley Malkin, M.D.
 Michael M. Margolin, M.D.
 Alan Pertchik, M.D.
 Howard B. Reiser, M.D.
 Allan Rubenstein, M.D.
 David P. Saur, M.D.
 Paul J. Silbert, M.D.
 Sidney Starkman, M.D.

VISITING FELLOWS

Gregory Bonomo, M.D.
 Laurence Carnay, M.D.
 Patricia Crumrine, M.D.
 Jocelyn Dougherty, M.D.
 Frances M. Dyro, M.D.
 Leonardo Garcia, M.D.
 Edward B. Heaton, M.D.
 Surendra Kaul, M.D.
 Judith Koehler, M.D.
 Mary Elizabeth Lell, M.D.
 Theodore A. List, M.D.
 Renee Malouf, M.D.
 Joseph Marcus, M.D.
 Morris A. Osborn, M.D.
 Michael Painter, M.D.
 A. David Rothner, M.D.
 Marc Rubenstein, M.D.
 Richard S. Schoenfeldt, M.D.
 Carmela Tardo, M.D.
 Frank R. Wilson, M.D.

***Obstetrics and Gynecology
Service***

(Sloane Hospital for Women)

DIRECTOR OF SERVICE

Raymond L. Vande Wiele, M.D.

ATTENDING OBSTETRICIANS AND
GYNECOLOGISTS

†Stanley M. Bysshe, M.D.
 Henry Clay Frick, II, M.D.
 Orlando J. Miller, M.D.
 Equinn W. Munnell, M.D.
 †C. Paul O'Connell, M.D.
 Charles M. Steer, M.D.

ASSOCIATE ATTENDING OBSTETRICIANS
AND GYNECOLOGISTS

Elizabeth B. Connell, M.D.
 Robert E. Hall, M.D.
 David B. Moore, M.D.
 Robert S. Neuwirth, M.D.
 W. Duane Todd, M.D.
 Gilbert J. Vosburgh, M.D.
 Susan W. Williamson, M.D.

ASSISTANT ATTENDING OBSTETRICIANS
AND GYNECOLOGISTS

Edward T. Bowe, M.D.
 Solan Chao, M.D.
 Vincent J. Freda, M.D.
 Dean J. Grandin, M.D.
 Raphael Jewelewicz, M.D.
 Raymond M. McCaffrey, M.D.
 Anne B. Pierson, M.D.
 Landrum B. Shettles, M.D.
 Meredith Sirmans, M.D.
 Harold Speert, M.D.
 Wolfgang Tretter, M.D.
 Michelle P. Warren, M.D.

ASSISTANT OBSTETRICIANS
AND GYNECOLOGISTS

Hussein K. Amin, M.D.
 Ming-Neng Yeh, M.D.

ASSISTANT ATTENDING GYNECOLOGIST
VANDERBILT CLINIC

†Thomas J. Parks, M.D.

ASSISTANT OBSTETRICIANS AND
GYNECOLOGISTS, VANDERBILT CLINIC

Lillian D. Nash, M.D.
 Lawrence J. Severino, M.D.
 Howard Lee Walker, M.D.

RESIDENTS

Stuart B. Arm, M.D.
 Ernst G. Bartsich, M.D.
 Joseph V. Battista, M.D.
 Jerome L. Belinson, M.D.
 Gerald L. Hamilton, M.D.
 Richard U. Levine, M.D.
 Arthur C. Pollack, M.D.

ASSISTANT RESIDENTS

Jeanette E. Akhter, M.D.
 Richard H. Blum, M.D.
 Richard R. Bowie, M.D.
 William B. Carey, M.D.
 Robert A. DiGiacinto, M.D.
 John E. Gaines, M.D.
 Charles S. Hawa, M.D.
 Achim Heintze, M.D.
 Irving D. Karten, M.D.
 Olga Kovic, M.D.
 Roger B. Lenke, M.D.
 Chin-Chu Lin, M.D.
 Suzanne Lokotiek, M.D.
 Jonathan C. McMath, M.D.
 Ann M. Milic, M.D.
 Eberhard A. Mueller-Heubach, M.D.
 Anthony G. Santomauro, M.D.
 G. Paul Savidge, M.D.
 Olive Soriero, M.D.

VISITING FELLOWS

Roy P. Ans, M.D.
 Milagros Benedito, M.D.
 Ernesto Bosch, M.D.
 Hossein Gharib, M.D.
 Parviz Jarrahy, M.D.
 Sahail Khalaf, M.D.
 Francisco Reyes, M.D.

Ophthalmology Service

(The Edward S. Harkness
Eye Institute)

DIRECTOR OF SERVICE

Arthur Gerard DeVoe, M.D.

ATTENDING OPHTHALMOLOGIST

George R. Merriam, Jr., M.D.

**ASSOCIATE ATTENDING
OPHTHALMOLOGISTS**

Charles J. Campbell, M.D.
† Frank D. Carroll, M.D.
Robert McC. Day, M.D.
Andrew deRoeth, Jr., M.D.
Anthony Donn, M.D.
Robert M. Ellsworth, M.D.
† J. Vincent Flack, M.D.
Ira Snow Jones, M.D.
Philip Knapp, M.D.

**ASSISTANT ATTENDING
OPHTHALMOLOGISTS**

D. Jackson Coleman, M.D.
William C. Cooper, M.D.
Richard W. Darrell, M.D.
John W. Espy, M.D.
R. Linsy Farris, M.D.
Max Forbes, M.D.
Arnold W. Forrest, M.D.
George M. Howard, M.D.
Francis A. L'Esperance, Jr., M.D.
* Ellen F. Regan, M.D.
Harold F. Spalter, M.D.
Stephen L. Trokel, M.D.
Emil Wirosko, M.D.

ASSISTANT OPHTHALMOLOGISTS

Myles M. Behrens, M.D.
Frank B. Hoeffle, M.D.
Richard J. Kossman, M.D.
Richard G. Lennon, M.D.
Hugh MacMillan Moss, M.D.
Thaddeus L. Wandel, M.D.

**ASSISTANT OPHTHALMOLOGIST
VANDERBILT CLINIC**

Milton F. Campbell, M.D.

RESIDENTS

Douglas F. Greer, M.D.
William A. James, M.D.
Lance D. Redler, M.D.
Maynard B. Wheeler, M.D.
Randolph Whitfield, Jr., M.D.

ASSISTANT RESIDENTS

David H. Abramson, M.D.
Frank C. Bell, M.D.
David H. Brown, M.D.
Craig Edmonds, M.D.
Donald H. Green, M.D.
Frederick A. Jackobiec, M.D.
Walter W. Merriam, M.D.

Guillermo Pico, Jr., M.D.
Balachandran Srinivasan, M.D.
Geoffrey G. White, M.D.

VISITING FELLOWS

William A. Bohart, M.D.
Howard Eggers, M.D.
Robert L. Jack, M.D.
Jesse Sigelman, M.D.

Orthopedic Surgery Service

(New York Orthopedic Hospital)

DIRECTOR OF SERVICE

Frank E. Stinchfield, M.D.

ATTENDING SURGEONS

George B. Ambrose, M.D.
David L. Andrews, M.D.
C. Andrew L. Bassett, M.D.
Everett C. Bragg, M.D.
Robert E. Carroll, M.D.
Alexander Garcia, M.D.
Sawnie R. Gaston, M.D.
S. Ashby Grantham, M.D.
† Halford Hallock, M.D.
† Leonidas A. Lantzounis, M.D.
Charles S. Neer, II, M.D.
Charles T. Ryder, M.D.

ASSOCIATE ATTENDING SURGEONS

D. Keith McElroy, M.D.
† Melvin B. Watkins, M.D.

ASSISTANT ATTENDING SURGEONS

Harold M. Dick, M.D.
Nasseroddin S. Eftekar, M.D.
Alice L. Garrett, M.D.
Rosamond Kane, M.D.
Merle H. Katzman, M.D.
Hugo A. Keim, M.D.
Wilfred Krom, M.D.
Peter LaMotte, M.D.
Robert S. Mathews, M.D.
James C. Parkes, II, M.D.
Andrew H. Patterson, M.D.
Robert M. Reiss, M.D.
Martin L. Sorger, M.D.

ASSISTANT ATTENDING SURGEONS**VANDERBILT CLINIC**

Peter N. Carbonara, M.D.
William U. Cavallaro, M.D.
Chauncey H. Dobson, M.D.
Richard L. Fenton, M.D.
William G. Hamilton, M.D.
Abraham C. Kovarsky, M.D.
Harvey Orlin, M.D.
Marvin L. Shelton, M.D.
William A. Sinton, M.D.
Lars A. Skilbred, M.D.
Joel D. Weinstein, M.D.
Joseph P. Zawadsky, M.D.
Eric K. Zitzmann, M.D.

SENIOR ANNIE C. KANE FELLOWS

John R. Denton, M.D.
• Jack Henry, M.D.
William R. Kennedy, M.D.
John K. Sigler, M.D.

JUNIOR ANNIE C. KANE FELLOWS

William B. Bowers, M.D.
Richard L. Petzoldt, M.D.

**JUNIOR ANNIE C. KANE FELLOWS &
RESIDENTS**

John F. Adams, Jr., M.D.
Robert L. Boothe, M.D.
James R. Cole, M.D.
Mark O. Gladstein, M.D.
Lawrence Katz, M.D.
Howard A. Kiernan, M.D.
Lawrence A. Lefkowitz, M.D.
Raphael K. Levine, M.D.
Barton Nisonson, M.D.
Joel E. Rothermel, M.D.
David M. Smith, M.D.
Ralph J. Venuto, M.D.
James B. Wessinger, M.D.
Eric S. White, M.D.
Russell R. Zelko, M.D.

ASSISTANT RESIDENTS

John H. Bargren, M.D.
Charles B. Brown, Jr., M.D.
Frederick M. Brunn, Jr., M.D.
John H. Buckner, M.D.
A. Roy Buerkle, M.D.
David C. Bush, M.D.
Robert N. Dunn, M.D.
John R. Freeman, M.D.
Robert W. Gause, M.D.
Andrew F. Greene, M.D.
Gary C. Hassman, M.D.
Charles V. Helming, M.D.
Joseph E. Imbriglia, M.D.
Christopher B. Michelsen, M.D.
Tom R. Norris, M.D.
Richard L. Worlund, M.D.

VISITING FELLOWS

Young H. Ha, M.D.
Myung Kim, M.D.
Joseph J. Nixon, M.D.
Sudhee Sudasna, M.D.
Isao Sugawa, M.D.
Andre Victoria, M.D.

Otolaryngology Service**DIRECTOR OF SERVICE**

Daniel C. Baker, Jr., M.D.

ATTENDING OTOLARYNGOLOGISTS

Milos Basek, M.D.
John J. Conley, M.D.
Robert M. Hui, M.D.
Jules G. Waltner, M.D.

† Inactive
* Leave of Absence

ASSOCIATE ATTENDING
OTOLARYNGOLOGIST

Robin M. Rankow, M.D., D.D.S.

ASSISTANT ATTENDING
OTOLARYNGOLOGISTS

† Edwin B. Bilchick, M.D.
Raymond M. Cole, M.D.
Robert C. Eberle, M.D.
Olaf Haroldson, Jr., M.D.
† Bela Marquit, M.D.
Frank V. Mignogna, M.D.
Lawrence Savetsky, M.D.
Malcolm H. Schvey, M.D.

ASSISTANT OTOLARYNGOLOGISTS

Neville W. Carmical, M.D.
Ronald C. Hamaker, M.D.
Robert R. Lang, M.D.
John Palesty, M.D.
John D. Piro, D.D.S.
Raymond B. Strauss, M.D.
Peter D. Westerhoff, Jr., M.D.

ASSISTANT OTOLARYNGOLOGISTS
VANDERBILT CLINIC

Claudio Crupi, M.D.
Howard D. Zipper, M.D.

RESIDENTS

William J. Dimattia, M.D.
Milan P. Kovar, M.D.
Ronald B. Lorenc, M.D.

ASSISTANT RESIDENTS

James Z. Cinberg, M.D.
Eugene P. Falk, M.D.
Raymond I. Fodor, M.D.
Marc S. Karlan, M.D.
Catherine A. Marley, M.D.
Richard S. Mega, M.D.
Jacob Z. Slepian, M.D.

VISITING FELLOW

Ned DiPasquale, M.D.
Barry S. Kronman, M.D.

Pathology Service

DIRECTOR OF SERVICE

Donald W. King, M.D.

ATTENDING NEUROPATHOLOGISTS

David Cowen, M.D.
Philip Duffy, M.D.

ATTENDING SURGICAL PATHOLOGISTS

Nathan Lane, M.D.
Raffaele Lattes, M.D.

ATTENDING PATHOLOGISTS

William A. Blanc, M.D.
Arthur W. Branwood, M.D.
S. Raymond Gambino, M.D.
Gabriel C. Godman, M.D.
John G. Gorman, M.D.

Conrad L. Pirani, M.D.
Ralph M. Richart, M.D.

ASSOCIATE ATTENDING
ORTHOPEDIC PATHOLOGISTS

† C. Zent Garber, M.D.
Austin D. Johnston, M.D.

ASSOCIATE ATTENDING
SURGICAL PATHOLOGISTS

Karl H. Perzin, M.D.
Marianne Wolff, M.D.

ASSOCIATE ATTENDING PATHOLOGISTS

Jack W. C. Hagstrom, M.D.
Myron Tannenbaum, M.D.
H. Joachim Wigger, M.D.

ASSISTANT ATTENDING PEDIATRIC
PATHOLOGIST

Thomas A. Blumenfeld, M.D.

ASSISTANT ATTENDING PATHOLOGISTS

Joshua A. Fierer, M.D.
Lewis A. Johnson, M.D.
Robert Pascal, M.D.

RESIDENTS

Teisa An, M.D.
Marie-Jeanne Castadot, M.D.
Santos Chawla, M.D.
Pierre Deglon, M.D.
Roger Derosena, M.D.
Cecilia M. Fenoglio, M.D.
John Fenoglio, M.D.
Alex Ferenczy, M.D.
Jared J. Gardner, M.D.
Albert Greenwood, M.D.
Arthur P. Hays, M.D.
Donald R. Jason, M.D.
Michael N. Koss, M.D.
Paul A. Krieger, M.D.
Vivien S. Loh, M.D.
Rogelio Lucas, M.D.
Gifford Y. Lum, M.D.
Jan M. Orenstein, M.D.
Frida Parker, M.D.
Albert Stanek, M.D.

INTERNS

Fred G. Silva, M.D.
Robert A. Strauss, M.D.
Anne-Marie Weber, M.D.
Lyn J. Jaffee, M.D.

VISITING FELLOWS

Richard Axel, M.D.
Kenneth F. Button, M.D.
John P. Caulfield, M.D.
Thomas M. Fasy, M.D.
Robert S. Galen, M.D.
Hyun J. Jung, M.D.
Ronald C. Kim, M.D.
Karl W. Lanks, M.D.
Virginia LiVolsi, M.D.

Joel Roth, M.D.
Woo-Yung Shin, M.D.
Jane Simon, M.D.
William Whetsell, M.D.
Nicholas J. Willson, M.D.

Pediatric Service

(Babies Hospital)

DIRECTOR OF SERVICE

Richard E. Behrman, M.D.

ATTENDING PEDIATRICIANS

Edward C. Curnen, Jr., M.D.
L. Stanley James, M.D.
Erich J. Kahn, M.D.
Michael Katz, M.D.
George I. Lythcott, M.D.
Stuart S. Stevenson, M.D.
Myron Winick, M.D.
Robert W. Winters, M.D.
James A. Wolff, M.D.

ASSOCIATE ATTENDING PEDIATRICIANS

† Harry S. Altman, M.D.
Jo Anne Brasel, M.D.
† John M. Brush, M.D.
Douglas S. Damrosch, M.D.
Ralph B. Dell, M.D.
Carolyn R. Denning, M.D.
Welton M. Gersony, M.D.
Susan G. Gordon, M.D.
Sylvia P. Griffiths, M.D.
Ruth C. Harris, M.D.
† J. Taylor Howell, M.D.
Jerry C. Jacobs, M.D.
Walter R. Kessler, M.D.
Rawle M. McIntosh, M.D.
Gilbert W. Mellin, M.D.
Robert B. Mellins, M.D.
† Katharine K. Merritt, M.D.
Thomas J. Moore, M.D.
Akira Morishima, M.D.
John F. Nicholson, M.D.
Katherine Sprunt, M.D.

ASSISTANT ATTENDING PEDIATRICIANS

Cyril A. L. Abrams, M.D.
Rose G. Ames, M.D.
Russell S. Asnes, M.D.
William A. Bauman, M.D.
Jennifer J. Bell, M.D.
Solomon J. Cohen, M.D.
William J. Davis, M.D.
Elinor F. Downs, M.D.
John M. Driscoll, Jr., M.D.
Yvonne T. Driscoll, M.D.
Hugh E. Evans, M.D.
Marguerite J. Gates, M.D.
Purez Flor M. Gaerlan, M.D.
Stephen Glaser, M.D.
Doris K. E. Goldberg, M.D.
Burton Grebin, M.D.
Constance J. Hayes, M.D.
William C. Heird, M.D.

ASSISTANT ATTENDING PEDIATRICIANS (continued)

Eugene L. Klenk, M.D.
 Ehud Krongrad, M.D.
 Martin I. Lorin, M.D.
 †Aildred A. Macdonald, M.D.
 Dean N. Martin, M.D.
 Celia Ores, M.D.
 Roderick C. Richards, M.D.
 David Rush, M.D.
 Jack G. Shiller, M.D.
 Joseph A. Silverman, M.D.
 Gilbert Simon, M.D.
 Anneliese L. Sitarz, M.D.
 Carl N. Steeg, M.D.
 Elizabeth Ufford, M.D.
 †Frederick H. von Hofe, M.D.
 Leo F. J. Wilking, M.D.
 †Agnes G. Wilson, M.D.

ASSISTANT PEDIATRICIANS

†Mary Adams, M.D.
 Albert J. Beckmann, M.D.
 Alma T. Blitz, M.D.
 Alexander Blum, Jr., M.D.
 Roger Challop, M.D.
 John L. Costa, M.D.
 Ruth U. Donovan, M.D.
 T. Donald Eisenstein, M.D.
 Bernard R. Feldman, M.D.
 †Lavinia G. M. Fox, M.D.
 Thurman B. Givan, Jr., M.D.
 Leonard Glass, M.D.
 Robert E. Jennings, M.D.
 Shirley A. Mayer, M.D.
 Daniel J. Melia, M.D.
 †Kenneth M. Metcalf, M.D.
 Walter L. Mitchell, Jr., M.D.
 Stanley G. Morrison, M.D.
 Herbert E. Poch, M.D.
 Morton H. Rachelson, M.D.
 Albert P. Rosen, M.D.
 Morton J. Seligman, M.D.
 Sheila A. Shanahan, M.D.
 Pradeep Sharma, M.D.
 Walter R. Stankewick, M.D.
 David Stiles, M.D.
 Martin B. Vita, M.D.
 Robert West, M.D.
 Doris L. Wethers, M.D.
 Robert C. Wheeler, M.D.
 †Daniel A. Wilcox, M.D.
 Preston Zucker, M.D.

ASSISTANT ATTENDING PEDIATRICIANS VANDERBILT CLINIC

Chris P. Katsampes, M.D.
 Elizabeth B. Watkins, M.D.

ASSISTANT PEDIATRICIANS VANDERBILT CLINIC

Martha L. Amarant, M.D.
 Robert E. Appleby, M.D.
 Jacob Boris, M.D.
 Mary E. Bradford, M.D.

† Inactive

§ Pediatric Psychiatry

Matilda B. Brust, M.D.
 Kathleen F. Catalano, M.D.
 Jane A. Erganian, M.D.
 Elizabeth G. Estrin, M.D.
 Bernard Etra, M.D.
 Burton M. Feinsmith, M.D.
 Matthew Feldman, M.D.
 Judith E. Frank, M.D.
 David N. Franklin, M.D.
 Gustave Gavis, M.D.
 I. Bruce Gordon, M.D.
 Bertram H. Grossman, M.D.
 John J. Kangos, M.D.
 Betty Chi Mei Lee Kuo, M.D.
 Michael L. Lapkin, M.D.
 Wiener Leblanc, M.D.
 Gerald Lieberman, M.D.
 Carolkay Lissenden, M.D.
 †George W. McCormick, M.D.
 Thomas W. Patrick, Jr., M.D.
 Mohamad Pourfar, M.D.
 Margaret M. Rice, M.D.
 Louis Rodrigues, M.D.
 John S. Rosmaita, M.D.
 Rosalinda Rubinsztain, M.D.
 Edith M. J. Kuo-Ying Shen, M.D.
 Kung-Tso Sheng, M.D.
 William H. Smith, M.D.
 Lucy H. Swift, M.D.
 Elizabeth F. Turnauer, M.D.
 William W. Whitten, M.D.

RESIDENTS

Nora J. Klein, M.D.
 Lorenzo S. Lavorgna, M.D.
 George M. Lazarus, M.D.
 Ramon J. Murphy, M.D.
 William T. Speck, M.D.

ASSISTANT RESIDENTS

Dennis Allendorf, M.D.
 Thomas L. Anderson, M.D.
 Robert Antar, M.D.
 Karen J. Back, M.D.
 Cornelia Balteanu, M.D.
 Mary Ann Colenda, M.D.
 Rita Fischer, M.D.
 Sai Hang Ho, M.D.
 Steve Kohl, M.D.
 Evelyn Lipper, M.D.
 Werner Meier, M.D.
 Richard L. Mones, M.D.
 James G. Nealis, M.D.
 Linda Pollack, M.D.
 Martha M. Provine, M.D.
 Geoffrey P. Redmond, M.D.
 Loren Southern, M.D.
 Raymond S. Stark, M.D.
 Aluizio R. Stopa, M.D.
 Mary B. Tierney, M.D.

INTERNS

Robert A. Boxer, M.D.
 Susan B. Carlson, M.D.

Janna C. Collins, M.D.
 Susan S. Dresdale, M.D.
 Douglas C. Henry, M.D.
 Peter Lang, M.D.
 Peter F. Migel, M.D.
 Joseph C. Napoli, M.D.
 Kenneth M. Settel, M.D.
 Harriet A. Siegel, M.D.
 Elda Simpson, M.D.

VISITING FELLOWS

Soja P. Bennett, M.D.
 William J. Chernak, M.D.
 William R. Griswold, M.D.
 Robert A. Herzlinger, M.D.
 Allan Hordof, M.D.
 Bethanne Jenks, M.D.
 Chuck-Kwan K. Lee, M.D.
 Robert D. LeVine, M.D.
 Mona Milstein, M.D.
 Sungmin Park, M.D.
 Frank Rodriguez-Martinez, M.D.
 Tove Rosen, M.D.
 Narayan R. Shah, M.D.
 Yong H. Shin, M.D.
 Carl S. Strande, M.D.
 Nestor Truccone, M.D.
 Hing-Ling Tsang, M.D.

Pharmacology

PHARMACOLOGIST

Brian F. Hoffman, M.D.

Psychiatry Service

DIRECTOR OF SERVICE

Lawrence C. Kolb, M.D.

ATTENDING PSYCHIATRISTS

Arnold M. Cooper, M.D.
 Elizabeth B. Davis, M.D.
 \$Harlow D. Dunton, M.D.
 Archie R. Foley, M.D.
 \$William Goldfarb, M.D.
 Ernest M. Gruenberg, M.D.
 †George A. Jervis, M.D.
 Aaron Karush, M.D.
 Sidney Malitz, M.D.
 Bernard L. Pacella, M.D.
 John D. Rainer, M.D.

ASSOCIATE ATTENDING PSYCHIATRISTS

Kenneth Z. Altschuler, M.D.
 James P. Cattell, M.D.
 John W. Cederquist, M.D.
 John A. Cook, M.D.
 Ronald R. Fieve, M.D.

ASSOCIATE ATTENDING PSYCHIATRISTS (continued)

Lothar Gidro-Frank, M.D.
Alexander H. Glassman, M.D.
Murray Glusman, M.D.
Donald S. Kornfeld, M.D.
Joseph M. Lubart, M.D.
Roger MacKinnon, M.D.
Robert Michels, M.D.
John F. O'Connor, M.D.
James H. Ryan, M.D.
Bernard B. Schoenberg, M.D.
Herbert Spiegel, M.D.

ASSISTANT ATTENDING PSYCHIATRISTS

Andre B. Ballard, M.D.
† Benjamin H. Balser, M.D.
Leah Beck, M.D.
Jules R. Bemporad, M.D.
Levon Z. Boyajian, M.D.
DeWitt L. Crandell, M.D.
Zira DeFries, M.D.
Richard G. Druss, M.D.
§ Olga Frankel, M.D.
Richard A. Gardner, M.D.
§ Rodman Gilder, Jr., M.D.
Jerome D. Goodman, M.D.
§ Sol L. Goodman, M.D.
Marvin I. Herz, M.D.
† Werner Hochstetter, M.D.
Winslow R. Hunt, M.D.
David Jaffe, M.D.
§ John P. Lambert, M.D.
Norman D. Lazar, M.D.
Alexander N. Levay, M.D.
Florence G. Liben, M.D.
Mary C. MacKay, M.D.
Helen C. Meyers, M.D.
† John A. P. Millet, M.D.
Winfred Overholser, Jr., M.D.
§ Robert P. Parkin, M.D.
Alvin H. Polatin, M.D.
Seymour C. Post, M.D.
Harry R. Potter, M.D.
§ Kathryn F. Prescott, M.D.
† Alfred Schick, M.D.
Jesse L. Schomer, M.D.
Kendon W. Smith, M.D.
John A. Sours, M.D.
Daniel N. Stern, M.D.
Milton Viederman, M.D.
Josef H. Weissberg, M.D.
§ Exie E. Welsch, M.D.
George H. Wilkie, M.D.

ASSOCIATE ATTENDING PSYCHIATRISTS VANDERBILT CLINIC

Burton August, M.D.
Arthur N. Avella, M.D.
§ Stephen L. Bennett, M.D.
§ John P. Briggs, M.D.
Paul F. Califano, M.D.
Eugene S. Forster, M.D.

Eugene A. Friedberg, M.D.
Lee R. Gardner, M.D.
§ Louis J. Gilbert, M.D.
Alvin J. Glick, M.D.
Gurston Goldin, M.D.
Victor Goldin, M.D.
Fiona Graham, M.D.
Lloyd A. Hamilton, Jr., M.D.
Stanley S. Heller, M.D.
Morton M. Hodas, M.D.
Clifton M. Howard, M.D.
Daniel Justman, M.D.
§ Peter Laderman, M.D.
Leon Lefer, M.D.
Naomi Leiter, M.D.
Burton A. Lerner, M.D.
Stephan J. Levitan, M.D.
Robert S. Liebert, M.D.
Stanley Lituchy, M.D.
Virginia Lozzi, M.D.
Neil M. MacLean, M.D.
Eugene M. Martin, M.D.
Philip Mertz, M.D.
Leonard M. Moss, M.D.
Robert S. Mumford, M.D.
John F. Oliven, M.D.
David Peretz, M.D.
Stephen P. Reibel, M.D.
Terry C. Rodgers, M.D.
Barbara R. Rosenfeld, M.D.
Nicholas Samios, M.D.
Lilli C. Shalsha, M.D.
Charles Siegal, M.D.
Arthur H. Stein, M.D.
Michael H. Stone, M.D.
Ralph N. Wharton, M.D.
Phillip Zeidenberg, M.D.

ASSISTANT ATTENDING PSYCHIATRISTS VANDERBILT CLINIC

Michael S. Aronoff, M.D.
John A. Atchley, M.D.
Charles W. Avery, M.D.
Athanasia Balkoura, M.D.
Donald C. Bell, M.D.
Robinette N. Bell, M.D.
Anne E. Bernstein, M.D.
Leon Chattah, M.D.
Stanley J. Coen, M.D.
Ellen M. Dolganos, M.D.
David L. Dunner, M.D.
Harold B. Esecover, M.D.
A. David Etess, M.D.
Jerry B. Finkel, M.D.
Bruce M. Forester, M.D.
Richard C. Friedman, M.D.
William W. Garitano, M.D.
Robert A. Glick, M.D.
Ivan K. Goldberg, M.D.
Kenneth Greenspan, M.D.
Sidney B. Heimbach, M.D.
Joel S. Hoffman, M.D.
Sonia W. Hyman, M.D.
Carlos I. Ifarraguerri, M.D.

David Iverson, M.D.
Martin Kantor, M.D.
Clarice J. Kestenbaum, M.D.
Gabriel V. Laury, M.D.
† Samuel Lowy, M.D.
George W. Luhrmann, Jr., M.D.
Michael R. Milano, M.D.
John D. O'Brien, M.D.
E. Rea Paidoussi, M.D.
Vladimir R. Piskacek, M.D.
John W. Rosenberger, M.D.
Arnold M. Rothstein, M.D.
M. Bruce Sarlin, M.D.
George Satran, M.D.
Eleanor S. Schuker, M.D.
Henry I. Spitz, M.D.
Sanford W. Stein, M.D.
Ruth Szmara, M.D.
Alfonso Tornusciolo, M.D.

ASSISTANT PSYCHIATRISTS VANDERBILT CLINIC

Harry D. Albert, M.D.
Harold Been, M.D.
Charles Carluccio, Jr., M.D.
Aristide H. Esser, M.D.
Maurice Golbey, M.D.
James G. Katis, M.D.
Ann G. Keill, M.D.
William J. Nemon, M.D.
Arthur H. Schore, M.D.

RESIDENTS

Estelle P. Bender, M.D.
Hector R. Bird, M.D.
Antal F. Borbely, M.D.
Jorg Bose, M.D.
Steven Buchanan, M.D.
Daniel E. Cohen, M.D.
Richard Cowan, M.D.
John F. Crow, M.D.
Peter B. Davol, M.D.
Walter A. Dietzgen, M.D.
John I. Dintenfuss, M.D.
Ira D. Feirstein, M.D.
Helen H. Glaser, M.D.
Jed Goldart, M.D.
Eugene Goldwater, M.D.
Michael J. Goran, M.D.
Ronald A. Grant, M.D.
Maria A. Guzman, M.D.
William B. Head, M.D.
Terry W. Hugg, M.D.
Lila Kalinich, M.D.
Ronald L. Kamm, M.D.
Betty Karron, M.D.
Neil B. Kavey, M.D.
Enid Lang, M.D.
Diane Lipson, M.D.
Ronald B. Lonesome, M.D.
Erica Loutsch, M.D.
Mark R. Mankoff, M.D.
Reed C. Moskowitz, M.D.
John W. Mudd, M.D.

† Inactive

§ Pediatric Psychiatry

RESIDENTS (continued)

Keith M. Muir, M.D.
 Jaime Nos, M.D.
 Louis Padavano, M.D.
 Henry A. Paul, M.D.
 Linda Pessar, M.D.
 Raymond J. Porzio, M.D.
 David Reed, M.D.
 Phyllis Robbins, M.D.
 Gary Rusk, M.D.
 Robert F. Savadore, M.D.
 Meri Schachter, M.D.
 Jonah W. Schein, M.D.
 Bernard S. Schwartz, M.D.
 Samuel G. Siris, M.D.
 Frieda H. Spady, M.D.
 Marsha Speller, M.D.
 Gerda H. Strika, M.D.
 Fidel Swana, M.D.
 Walter Tardy, M.D.
 Peyton Thompson, M.D.
 Charles O. Tucek, M.D.
 William M. Tucker, M.D.
 Richard L. Weidenbacher, M.D.
 Samuel Weinstein, M.D.
 Richard W. Weiss, M.D.
 Donald R. Weyman, M.D.
 Daniel Williams, M.D.
 Arthur Wolpert, M.D.
 Stuart C. Yudofsky, M.D.

Public Health**BIOSTATISTICIAN**

John W. Fertig, PH.D.

PARASITOLOGIST

Michael Katz, M.D.

Radiology Service**DIRECTOR OF SERVICE**

William B. Seaman, M.D.

ATTENDING RADIOLOGISTS

David H. Baker, M.D.
 Walter E. Berdon, M.D.
 Chu Huai Chang, M.D.
 Kent Ellis, M.D.
 Sadek Hilal, M.D.
 Philip M. Johnson, M.D.
 *Guy D. Potter, M.D.
 Ralph Schlaeger, M.D.
 Ernest H. Wood, M.D.

ASSOCIATE ATTENDING RADIOLOGISTS

Thane Asch, M.D.
 Frieda Feldman, M.D.
 Walter G. Lutz, M.D.
 Patricia Tretter, M.D.
 Robert L. Waldron, II, M.D.

ASSISTANT ATTENDING RADIOLOGISTS

William L. Campbell, M.D.
 William J. Casarella, M.D.
 David A. Follett, M.D.
 Stuart L. Fuld, M.D.
 Bentley A. Hollander, M.D.
 Donald L. King, M.D.
 James A. Reilly, Jr., M.D.
 Louis A. Rottenberg, M.D.
 John J. Senyszyn, M.D.
 Bruce E. Wiley, M.D.

ASSISTANT RADIOLOGISTS

Claude Yuk-Yeung Chong, M.D.
 Shelby J. Galloway, M.D.
 Ira A. Horowitz, M.D.
 Kenneth Jewel, M.D.
 Patricia Stagner Kaim, M.D.
 Peter A. Livingston, M.D.
 *Bruce L. McClennan, M.D.
 Harry Morgan, M.D.
 Edward J. Pollock, M.D.
 Paul Sane, M.D.

RESIDENTS

Lawrence R. Muroff, M.D.
 William A. Renert, M.D.

ASSISTANT RESIDENTS

Olivera Bedic, M.D.
 Lewis L. Bruggeman, M.D.
 Joel A. Budin, M.D.
 Woomyung Choe, M.D.
 Brian Donnelly, M.D.
 Herbert Gerstein, M.D.
 Richard P. Gold, M.D.
 William M. Green, M.D.
 Leonidas Harisiadis, M.D.
 Charles Heller, M.D.
 Conrade C. Jaffee, M.D.
 Robert L. Krugman, M.D.
 Florence Li, M.D.
 Hanna T. Norwint, M.D.
 Charles Noshier, M.D.
 Barry D. Pressman, M.D.
 Keith C. Richards, M.D.
 Steven D. Richman, M.D.
 Robert W. Rottenberg, M.D.
 Norman Schulman, M.D.
 Ellen F. Silverstein, M.D.
 James C. Smith, Jr., M.D.
 Philip Sorabella, M.D.
 Richard N. Taxin, M.D.
 Joseph F. Walter, M.D.
 Charles A. Whelan, M.D.
 John J. Witowski, M.D.
 Jack Zyroff, M.D.

VISITING FELLOWS

Marc Aube, M.D.
 Dvorak Balsam, M.D.
 Paul M. Bothner, M.D.
 Richard B. Bridenbaugh, M.D.
 Richard Fellows, M.D.
 Paul M. Grappell, M.D.
 Jack Haller, M.D.

Richard E. Holgate, M.D.
 Jeffrey Kranzler, M.D.
 Harold Pachtman, M.D.
 Lewis M. Rothman, M.D.
 Thomas Slovis, M.D.
 Frederick Thyng, M.D.

Rehabilitation Medicine Service**DIRECTOR OF SERVICE**

Robert C. Darling, M.D.

ATTENDING REHABILITATION PHYSICIAN

John A. Downey, M.D.

ASSOCIATE ATTENDING REHABILITATION PHYSICIANS

Morton Hoberman, M.D.
 Nathan Kaplan, M.D.
 Shyh-Jong Yue, M.D.

ASSISTANT ATTENDING REHABILITATION PHYSICIANS

Albert D. Anderson, M.D.
 Luke S. W. Chu, M.D.
 Antonio Cocchiarella, M.D.
 Stanley J. Myers, M.D.
 Naomi Turner, M.D.

ASSISTANT REHABILITATION PHYSICIANS

Yasoma B. Challenor, M.D.
 Cayetano C. Co, M.D.
 Lucille Tsu Pai, M.D.
 Rodolfo L. Reyes, M.D.
 Herbert L. Thornhill, M.D.

ASSISTANT REHABILITATION PHYSICIAN VANDERBILT CLINIC

Ludmila S. Finkelstein, M.D.

ASSISTANT RESIDENTS

Erwin G. Gonzalez, M.D.
 Alfred Hess, D.O.
 Gopalan Nambiar, M.D.

VISITING FELLOWS

Martha L. Amarant, M.D.
 Arun Bhattacharyya, M.D.
 Dong Wook Cho, M.D.
 Leonore Z. Gladstone, M.D.
 Hie Chul Kim, M.D.
 Leonor Martinez, M.D.
 Damyanti G. Moorjani, M.D.
 Yun Shim, M.D.
 Wellington Wei, M.D.

Surgery Service**DIRECTOR OF SERVICE**

Keith Reemtsma, M.D.

ATTENDING SURGEONS

Harold G. Barker, M.D.
 George F. Crikelair, M.D.

ATTENDING SURGEONS

Jose M. Ferrer, Jr., M.D.
 *David V. Habif, M.D.
 Frederic P. Herter, M.D.
 Robert B. Hiatt, M.D.
 John M. Kinney, M.D.
 James R. Malm, M.D.
 Ferdinand F. McAllister, M.D.
 Milton R. Porter, M.D.
 Thomas V. Santulli, M.D.
 Arthur B. Voorhees, Jr., M.D.

ASSOCIATE ATTENDING SURGEONS

Hugh Auchincloss, Jr., M.D.
 Frederick O. Bowman, Jr., M.D.
 Joseph A. Buda, M.D.

†Henry S. F. Cooper, M.D.
 Bard Cosman, M.D.
 Carl R. Feind, M.D.
 Charles W. Findlay, Jr., M.D.
 Edmund N. Goodman, M.D.
 †Robert S. Grinnell, M.D.
 Frank E. Gump, M.D.
 Alfred Jaretzki, III, M.D.
 David M. C. Ju, M.D.
 Herbert C. Maier, M.D.
 Alfred M. Markowitz, M.D.
 John B. Price, Jr., M.D.
 John F. Prudden, M.D.
 Frederick R. Randall, M.D.
 Grant Sanger, M.D.
 Edward B. Self, M.D.
 Francis C. Symonds, Jr., M.D.
 Philip D. Wiedel, M.D.

ASSISTANT ATTENDING SURGEONS

Paul M. Beach, Jr., M.D.
 Robert G. Bertsch, M.D.
 Shivaji B. Bhonslay, M.D.
 Harold M. Bruck, M.D.
 Richard N. Edie, M.D.
 Kenneth A. Forde, M.D.
 Paul H. Gerst, M.D.
 John E. Hutchinson, M.D.
 Sven J. Kister, M.D.
 John N. Schullinger, M.D.
 †John Scudder, M.D.
 Richard Weil, III, M.D.
 Bashir A. Zikria, M.D.

ASSISTANT ATTENDING SURGEONS
VANDERBILT CLINIC

Marvin L. Hartstein, M.D.
 Thomas E. Shaw, M.D.

ASSISTANT SURGEONS
VANDERBILT CLINIC

Vincent W. Ansanelli, M.D.
 Alfred A. Azzoni, M.D.
 Sherman M. Bull, M.D.
 Kenneth C. Morley, Jr., M.D.
 Charles A. Slanetz, Jr., M.D.
 James S. Todd, M.D.

RESIDENTS

Stephen H. Batthany, M.D.
 Robert G. Blabey, Jr., M.D.
 David B. Davidson, M.D.
 William R. Dietrick, M.D.
 Charlton B. Futch, M.D.
 Robert A. Gardner, M.D.
 Robert D. Gongaware, M.D.
 Paul LoGerfo, M.D.
 Martin Max, M.D.
 Donald W. Miller, Jr., M.D.
 John I. Relland, M.D.
 Henry Spotnitz, M.D.
 Philip W. Thieman, M.D.
 Kari Vitikainen, M.D.
 George L. Zorn, Jr., M.D.

ASSISTANT RESIDENTS

Kate N. Aseme, M.D.
 Arnold H. Belgrair, M.D.
 Richard A. Bolt, M.D.
 James Bordley, IV, M.D.
 R. Huntington Breed, II, M.D.
 Leonard A. Bruno, M.D.
 Daniel C. Budd, M.D.
 Jorge L. Camunas, M.D.
 Mark E. Chodoff, M.D.
 Arnold L. Dellon, M.D.
 Wilfrido Feliciano, M.D.
 Peter B. Fodor, M.D.
 Owen D. Fraser, M.D.
 G. Araccige Ganepolo, M.D.
 Richard J. Gusberg, M.D.
 Paul R. Hickey, M.D.
 John C. Iacuzzo, M.D.
 Willard J. Ingram, M.D.
 Gerald Kadis, M.D.
 Edwin Lowd, M.D.
 John C. Madigan, Jr., M.D.
 Milton Meyers, M.D.
 Francis A. Mithen, M.D.
 Anthony L. Moulton, M.D.
 Roman Nowygro, M.D.
 Alberto Otero, M.D.
 George K. Parkins, M.D.
 Gerald H. Pitman, M.D.
 Edward W. Powers, M.D.
 Theodore D. Probst, M.D.
 Arthur Rettig, M.D.
 George W. Tietjen, M.D.
 Collin J. Weber, M.D.
 Winfield J. Wells, M.D.
 Anthony Whitemore, M.D.
 Evan V. Wolarsky, M.D.

RESIDENTS — PLASTIC SURGERY

Henry L. Huckaby, M.D.
 Ivo Janecka, M.D.
 Joel M. Rein, M.D.

ASSISTANT RESIDENTS—PLASTIC SURGERY

Robert A. Gutstein, M.D.
 Nunzio Mainieri, M.D.

INTERNS

Brent R. Ain, M.D.
 Michael Bogdasarian, M.D.
 Anthony Cabot, M.D.
 Marc A. Clachko, M.D.
 Joseph G. Daines, M.D.
 Howard F. Floch, M.D.
 Marc Goldstein, M.D.
 Mary M. Kemeny, M.D.
 Eli Milch, M.D.
 Robert J. Porter, Jr., M.D.
 Robert A. Stanton, M.D.
 Kenneth M. Steinglass, M.D.
 Joseph E. Tripi, M.D.

VISITING FELLOW

Roger W. MacMillan, M.D.

Urology Service

(J. Bentley Squier Urological Clinic)

DIRECTOR OF SERVICE

John K. Lattimer, M.D.

ATTENDING UROLOGIST

Ralph J. Veenema, M.D.

ASSOCIATE ATTENDING UROLOGISTS

Stanley B. Braham, M.D.
 J. Timothy Donovan, M.D.
 Myron S. Roberts, M.D.
 Hans H. Zinsser, M.D.

ASSISTANT ATTENDING UROLOGISTS

Frank W. Longo, M.D.
 Peter J. Puchner, M.D.
 Nicholas A. Romas, M.D.
 Arthur M. Smith, M.D.
 Aurelio C. Uson, M.D.

ASSISTANT UROLOGISTS

Peter N. DeSanctis, M.D.
 Louis J. Dougherty, M.D.
 John P. Grant, Jr., M.D.
 Michael W. Justice, M.D.
 Stanley J. Landau, M.D.
 †Meyer M. Melicow, M.D.
 Harry Seneca, M.D.
 Sandor H. Wax, M.D.
 Ralph C. Yeaw, M.D.

ASSISTANT UROLOGISTS
VANDERBILT CLINIC

Stanley M. Bloom, M.D.
 Frederick S. Dick, M.D.
 Clement A. Furey, M.D.
 Philip B. Jensen, M.D.
 †Stanford Pulrang, M.D.
 Charles E. Umhey, Jr., M.D.
 Arthur T. Willetts, M.D.

† Inactive

* Leave of Absence

RESIDENTS

Richard H. Bard, M.D.
 John C. Byrne, M.D.
 John G. Feminella, Jr., M.D.
 Anthony Horan, M.D.
 Joseph Priestly, M.D.
 Michael D. Wechsler, M.D.

ASSISTANT RESIDENTS

Stephen C. Bass, M.D.
 John D. Birkoff, M.D.
 Gheorghe D. Ionescu, M.D.
 Magued R. Megalli, M.D.
 Grier Merwin, M.D.
 James Mooney, M.D.
 Neil B. Phillips, M.D.
 Madduri D. Prasad, M.D.
 Leonard Rudin, M.D.
 Steven L. Sholem, M.D.
 Walter U. Stingle, M.D.
 James A. Umhey, M.D.
 A. Roger Wiederhorn, M.D.

VISITING FELLOWS

Gelmar Borges, M.D.
 Sagbe Ikiriko, M.D.
 Ulrich Stams, M.D.
 Bahman F. Vakili, M.D.
 Arthur Wollman, M.D.

Chiefs of Clinics

Dr. Leonard Brand.....*Anesthesiology*
 Dr. Saul L. Sanders.....*Dermatology*
 Dr. Albert R. Lamb, Jr.....*Medicine (Group Clinic)*
 Dr. Peter W. Carmel.....*Neurological Surgery*
 Dr. Linda D. Lewis.....*Neurology*
 Dr. Susan W. Williamson...*Obstetrics & Gynecology*
 Dr. George R. Merriam, Jr.....*Ophthalmology*

Dr. Alexander Garcia*Orthopedic Surgery*
 Dr. Robert M. Hui.....*Otolaryngology*
 Dr. Russell S. Asnes.....*Pediatrics*
 Dr. Roger MacKinnon*Psychiatry*
 Dr. Stanley J. Myers.....*Rehabilitation Medicine*
 Dr. Robert G. Bertsch.....*Surgery*
 Dr. Frank W. Longo*Urology*

Faculty of Medicine
College of Physicians and Surgeons
Columbia University in the City of New York

Faculty of Medicine

College of Physicians and Surgeons

Columbia University in the City of New York

Officers of the Faculty of Medicine

William J. McGill, PH.D.	.....President of the University
Wm. Theodore deBary, PH.D.	.....Executive Vice President for Academic Affairs
Paul A. Marks, M.D.	.....Vice President in Charge of Medical Affairs and Dean of the Faculty of Medicine
Frederick B. Putney, PH.D.	.....Assistant Vice President in Charge of Medical Affairs
Frederick G. Hofmann, PH.D.	.....Associate Dean for Admissions
George I. Lythcott, M.D.	.....Associate Dean for Urban and Community Health Affairs
Councilman Morgan, M.D.	.....Associate Dean for Curriculum and Student Affairs
Ann S. Peterson, M.D.	.....Associate Dean for Student Affairs
Bernard Schoenberg, M.D.	.....Associate Dean for Allied Health Affairs
Donald F. Tapley, M.D.	.....Associate Dean for Faculty Affairs
Melvin D. Yahr, M.D.	.....Associate Dean for Postgraduate Education
John H. Bryant, M.D.	.....Associate Dean (Public Health)
Mary I. Crawford, ED.D.	.....Associate Dean (Nursing)
Bernard D. Challenor, M.D.	.....Assistant Dean for Community and Urban Health Affairs
Inez E. Klinck, B.A.	.....Assistant Dean for Academic Affairs

Executive Committee of the Faculty of Medicine

Russell S. Asnes	Donald S. Kornfeld	Wilbur H. Sawyer
Richard E. Behrman	Alvin I. Krasna	David Schachter
Mary I. Crawford	John H. Laragh	Joseph G. Sweeting
Richard F. Defendini	Paul A. Marks	Donald F. Tapley
Kent Ellis		Ralph J. Veenema

Faculty Council of the Faculty of Medicine

David L. Andrews	Mary I. Crawford	Frederick G. Hofmann
Charles A. Ashley	Robert C. Darling	Allen I. Hyman
Russell S. Asnes	Charles W. Davidson	Georgianna Jagiello
Kimball C. Atwood	Robert M. Day	L. Stanley James
Daniel C. Baker, Jr.	Richard F. Defendini	Joannes H. Karis
David H. Baker	Edward W. Dempsey	Gordon Kaye
Milos Basek	A. Gerard DeVoe	Donald L. King
Richard E. Behrman	Ruth Dickinson	Donald W. King
Alvin J. Binkert	John A. Downey	Lawrence C. Kolb
Edward T. Bowe	Elinor F. Downs	Donald S. Kornfeld
Philip W. Brandt	Philip E. Duffy	Alvin Krasna
John S. Britten	Ann Earle	Robert S. Krooth
John H. Bryant	Kent Ellis	John H. Laragh
Paul J. Cannon	Paul D. Ellner	John K. Lattimer
Herbert G. Cave	Philip Feigelson	Edgar Leifer
Bernard D. Challenor	Sidney Gilman	Francis C. Lindaman
Chu H. Chang	Jack W. C. Hagstrom	Frank W. Longo
Erwin Chargaff	Donald H. Harter	George I. Lythcott
George W. Cooper, Jr.	Wendell B. Hatfield	Paul A. Marks
James W. Correll	Brian F. Hoffman	Richard L. Masland

Faculty Council of the Faculty of Medicine — Continued

Ferdinand F. McAllister	Charles A. Ragan, Jr.	George K. Smelser
David J. McConnell	Keith Reemtsma	Sol Spiegelman
Gilbert W. Mellin	Ellen F. Regan	Stuart S. Stevenson
Robert B. Mellins	Haynes Rice	Frank E. Stinchfield
Robert Michels	Richard A. Rifkind	Joseph G. Sweeting
Councilman Morgan	Harry M. Rose	Francis C. Symonds, Jr.
Melvin L. Moss	Charles T. Ryder	John V. Taggart
Lester A. Mount	Ernest Salanitre	Stuart W. Tanenbaum
Richard Moyer	Saul L. Sanders	Donald F. Tapley
Carl T. Nelson	Nancy M. Sargis	Peter B. Terenzio
Harold C. Neu	Wilbur H. Sawyer	Herbert L. Thornhill
Shih-Hsun Ngai	David Schachter	W. Duane Todd
Charles R. Noback	Bernard B. Schoenberg	Raymond L. Vande Wiele
Mero R. Nocenti	John N. Schullinger	Ralph J. Veenema
George O. Papanek	Malcolm H. Schvey	Arthur R. Wertheim
Robert Pascal	William B. Seaman	Walter A. Wichern
Ann S. Peterson	Edward B. Self	Myron Winick
Harriet B. Presser	Margarita Silva-Hutner	Melvin D. Yahr
Frederick B. Putney	Lance Simpson	Bashir A. Zikria

Academic Committees

CHAIRMEN'S ADVISORY COMMITTEE TO THE DEAN

Paul A. Marks, Chairman

Daniel C. Baker, Jr.	Donald W. King	Charles A. Ragan
Richard E. Behrman	Lawrence C. Kolb	Keith Reemtsma
Alvin J. Binkert	Robert S. Krooth	Harry M. Rose
John H. Bryant	John K. Lattimer	Bernard Schoenberg
Bernard Challenor	George I. Lythcott	William B. Seaman
Erwin Chargaff	Richard L. Masland	Sol Spiegelman
Mary I. Crawford	Councilman Morgan	Frank E. Stinchfield
Robert C. Darling	Melvin L. Moss	John V. Taggart
Charles W. Davidson	Lester A. Mount	Donald F. Tapley
Edward W. Dempsey	Carl T. Nelson	Peter B. Terenzio
A. Gerard DeVoe	Shih-Hsun Ngai	Raymond L. Vande Wiele
Frederick G. Hofmann	Ann S. Peterson	Myron Winick
Brian E. Hoffman	Frederick B. Putney	Melvin D. Yahr

COMMITTEE ON ADMISSIONS

Frederick G. Hofmann, Chairman

Hugh F. Butts	Wendell Hatfield	Ann S. Peterson
Carolyn Denning	Norman Kahn	Joseph A. Silverman
John A. Downey	Ronald Katz	Philip D. Wiedel
Kenneth A. Forde	Albert R. Lamb, Jr.	Paul A. Marks, Dean, <i>ex officio</i>
Andrew G. Frantz	Robert Michels	Student:
Frank Gump	Mero Nocenti	Lawrence D. Lunsford

COMMITTEE ON GRADUATE CLINICAL INSTRUCTION

Melvin D. Yahr, Chairman

Daniel C. Baker, Jr.	Donald W. King	Charles A. Ragan
Richard E. Behrman	Lawrence C. Kolb	Keith Reemtsma
John H. Bryant	Robert S. Krooth	Harry M. Rose
Erwin Chargaff	John K. Lattimer	William B. Seaman
Robert C. Darling	Richard L. Masland	Frank E. Stinchfield
Edward W. Dempsey	Councilman Morgan	John V. Taggart
Arthur Gerard DeVoe	Lester A. Mount	Raymond L. Vande Wiele
Brian F. Hoffman	Shih-Hsun Ngai	The Dean, <i>ex officio</i>

CURRICULUM COMMITTEE

Councilman Morgan, Chairman

Ernest W. April
Edward A. Cain, Jr.
Bernard Challenor
Edward M. Dwyer
Philip Feigelson
S. Raymond Gambino
Alexander Garcia
Welton Gersony

Lowell M. Greenbaum
Peter Holt
Alfred Jaretzki
Robert Michels
Harold Neu
Richard Rifkind
David Schachter
Philip Wiedel

Students:
Eric Drimmer
Alan Gladstone
Jerry Gliklich
Elliott Grossbard
David Habif
James Maxwell
Roger Rosenstein
Steven Rosenthal

DELEGATES TO THE UNIVERSITY SENATE

Jennifer Bell
Bernard D. Challenor
Alexander Garcia

Frederic P. Herter
Edward B. Leahey
Paul A. Marks

David Schachter
David Tornberg
Melvin D. Yahr

Joint Committees of Faculty of Medicine and Professional Staff of Presbyterian Hospital

ADVISORY COMMITTEE ON PRIVATE PRACTICE

Paul A. Marks, Chairman

Richard E. Behrman
A. J. Binkert

Richard L. Masland
Charles A. Ragan
Keith Reemtsma

Frank Stinchfield
Raymond L. Vande Wiele

JOINT COMMITTEE OF THE FACULTY AND THE MEDICAL BOARD ON THE FACILITIES OF THE MEDICAL CENTER

A. J. Binkert, Co-Chairman

Paul A. Marks, Co-Chairman

Richard E. Behrman
Richard N. Kerst
Donald W. King
Lawrence C. Kolb
John H. Laragh

George I. Lythcott
Richard L. Masland
Milton R. Porter
Frederic B. Putney
Charles A. Ragan

Keith Reemtsma
Frank Stinchfield
Donald F. Tapley
Raymond L. Vande Wiele
Carl R. Wise

School of Dental and Oral Surgery

Columbia University in the City of New York

Officers of the Faculty of Dental and Oral Surgery

William J. McGill, P.H.D.....	<i>President of the University</i>
Wm. Theodore deBary, PH.D., L.H.D., D.LITT....	<i>Executive Vice President for Academic Affairs and Provost of the University</i>
Paul A. Marks, M.D.....	<i>Vice President in Charge of Medical Affairs</i>
Melvin L. Moss, D.D.S., PH.D.....	<i>Dean</i>
George L. O'Grady, D.D.S.....	<i>Assistant Dean</i>
Stephen Wotman, D.D.S.....	<i>Special Assistant to the Dean</i>
Harold L. Applewhite, D.D.S., M.P.H.....	<i>Associate Professor of Dentistry</i>
Herbert D. Ayers, D.D.S.....	<i>Associate Professor of Dentistry</i>
Herbert J. Bartelstone, D.D.S., PH.D.....	<i>Professor of Dentistry and Professor of Pharmacology (on leave, academic year)</i>
Frank E. Beube, L.D.S., D.D.S.....	<i>Adjunct Professor of Dentistry</i>
Edward A. Cain, Jr., D.D.S.....	<i>Professor of Dentistry</i>
Victor S. Caronia, D.D.S.....	<i>Associate Professor of Dentistry</i>
Erwin Chargaff, PH.D.....	<i>Professor of Biochemistry</i>
Joseph A. Cuttita, D.D.S.....	<i>Professor of Dentistry</i>
Edward W. Dempsey, PH.D.....	<i>Professor of Anatomy</i>
Nicholas A. Di Salvo, D.D.S., PH.D.....	<i>Professor of Dentistry</i>
Robert Gottsegen, D.D.S.....	<i>Professor of Dentistry</i>
Brian F. Hoffman, M.D.....	<i>David Hosack Professor of Pharmacology</i>
Sidney L. Horowitz, D.D.S.....	<i>Professor of Dentistry</i>
Donald W. King, M.D.....	<i>Francis Delafield Professor of Pathology</i>
Austin H. Kutscher, D.D.S.....	<i>Associate Professor of Dentistry</i>
Joseph M. Leavitt, D.D.S.....	<i>Clinical Professor of Dentistry</i>
John J. Lucca, D.D.S.....	<i>Professor of Dentistry</i>
Patricia A. McLean, M.A.....	<i>Associate Professor of Dental Hygiene</i>
Irwin D. Mandel, D.D.S.....	<i>Professor of Dentistry</i>
Henry I. Nahoum, D.D.S.....	<i>Associate Professor of Dentistry</i>
Harry M. Rose, M.D.....	<i>John E. Borne Professor of Medical and Surgical Research</i>
Solomon N. Rosenstein, D.D.S.....	<i>Professor of Dentistry</i>
John V. Taggart, M.D.....	<i>Professor of Physiology</i>
Ennio L. Uccellani, D.D.S.....	<i>Associate Professor of Dentistry</i>
Edward V. Zegarelli, D.D.S., M.S.....	<i>Edwin S. Robinson Professor of Dentistry</i>

Academic Committees

EXECUTIVE COMMITTEE (Department of Dental and Oral Surgery)

Melvin L. Moss, Chairman

Harold L. Applewhite
Edward A. Cain, Jr.
Nicholas A. Di Salvo
Robert Gottsegen
Sidney L. Horowitz

Joseph M. Leavitt
John J. Lucca
Patricia A. McLean
Irwin D. Mandel

George A. Minervini
George L. O'Grady
Solomon N. Rosenstein
David J. Smith
Edward V. Zegarelli

COMMITTEE ON ADMISSIONS (UNDERGRADUATE)

Joseph A. Cuttita, Chairman

Julien W. Anderson
Roy Boelstler

Victor S. Caronia
Henry I. Nahoum
George L. O'Grady

David J. Smith
Melvin L. Moss (Ex officio)

COMMITTEE ON ADMISSIONS (DENTAL HYGIENE)

Patricia A. McLean, Chairman

Joseph A. Cuttita

Marlene Klyvert
Dona E. W. McKinney

Melvin L. Moss (Ex-officio)

COMMITTEE ON INSTRUCTION

Edward A. Cain, Jr., Chairman

Harold L. Applewhite
Edward W. Dempsey
Nicholas A. Di Salvo
Samuel F. Dworkin
Robert Gottsegen
Sidney L. Horowitz
Norman Kahn
David Kaplan

Donald W. King
Joseph M. Leavitt
Andrew M. Linz
John J. Lucca
Patricia A. McLean
Irwin D. Mandel
George A. Minervini
Charles R. Noback

Mero R. Nocenti
George L. O'Grady
Solomon N. Rosenstein
Letty Moss-Salentijn
David J. Smith
Edward Stroh
Edward V. Zegarelli
Melvin L. Moss (Ex-officio)

POSTGRADUATE COMMITTEE

Sidney L. Horowitz, Chairman

Joseph A. Cuttita
Nicholas A. Di Salvo
Robert Gottsegen
Joseph M. Leavitt

John J. Lucca
George A. Minervini
Irving J. Naidorf
George L. O'Grady

Philip Person
Solomon N. Rosenstein
Edward V. Zegarelli
Melvin L. Moss (Ex-officio)

DELEGATES TO UNIVERSITY SENATE

Representing Tenured Faculty.....Edward A. Cain, Jr.
Representing Non-Tenured Faculty.....Morton C. Rennert
Representing students of the School of Dental and Oral Surgery.....Mark H. Jaffe

Academic Staff

College of Physicians and Surgeons
Columbia University in the City of New York

Academic Staff

College of Physicians and Surgeons

Columbia University in the City of New York

Emeritus Officers

J. Burns Amberson*Medicine*
 Dana W. Atchley*Medicine*
 Frank B. Berry*Surgery*
 Harold W. Brown*Parasitology*
 Gordon M. Bruce*Ophthalmology*
 John Caffey*Radiology*
 Lester Cahn*Oral Pathology*
 Wilfred M. Copenhaver*Anatomy*
 Andre F. Courmand*Medicine*
 D. Anthony D'Esopo*Obstetrics and Gynecology*
 Zacharias Dische*Biochemistry*
 John H. Dunnington*Ophthalmology*
 Herbert O. Elftman*Anatomy*
 George W. Fish*Urology*
 Charles A. Flood*Medicine*
 Goodwin L. Foster*Biochemistry*
 Jacob Furth*Pathology*
 Elizabeth S. Gill*Nursing*
 Ross Golden*Radiology*
 Leonard J. Goldwater*Occupational Medicine*
 Harry Grundfest*Neurology*
 Cushman D. Haagensen*Surgery*
 Harold D. Harvey*Surgery*
 Michael Heidelberger*Immunochemistry*
 Paul F. A. Hofer*Neurology*
 George H. Humphreys II*Surgery*
 Harold W. Jacox*Radiology*
 Maxwell Karshan*Biochemistry*
 Forrest E. Kendall*Biochemistry*
 William S. Langford*Psychiatry*
 Margaret R. Murray LeDoux*Anatomy*

Maurice Lenz*Radiology*
 Robert L. Levy*Medicine*
 Robert F. Loeb*Medicine*
 Rustin McIntosh*Pediatrics*
 Meyer M. Melicow*Urology*
 H. Houston Merritt. *Dean Emeritus and Vice President*
 Emeritus in Charge of Medical Affairs
 Karl Meyer*Biochemistry*
 David Nachmansohn*Biochemistry*
 Phillip O. Polatin*Psychiatry*
 J. Lawrence Pool*Neurological Surgery*
 Edith H. Quimby*Radiology (Physics)*
 Willard C. Rappleye. *Dean Emeritus and Vice President*
 Emeritus in Charge of Medical Affairs
 Dickinson W. Richards*Medicine*
 Fordyce B. St. John*Surgery*
 John E. Scarff*Neurological Surgery*
 William H. Sebrell, Jr.*Nutrition*
 Beatrice Seegal*Microbiology*
 Aura E. Severinghaus*Anatomy and Associate*
 Dean Emeritus
 Lawrence W. Sloan*Surgery*
 Alan DeF. Smith*Orthopedic Surgery*
 William Benham Snow*Physical Medicine*
 Warren M. Sperry*Biochemistry*
 Howard C. Taylor*Obstetrics and Gynecology*
 Benjamin P. Watson*Obstetrics and Gynecology*
 Jerome P. Webster*Surgery*
 Maynard C. Wheeler*Ophthalmology*
 Abner Wolf*Neuropathology*
 Joseph Zubin*Psychology*

Anatomy

PROFESSORS

Malcolm B. Carpenter, M.D.
 Edward W. Dempsey, M.D.
 (Chairman)
 Frederick A. Mettler, M.D.
 (Neurology)
 Melvin L. Moss, D.D.S.
 (Dean, School of Dental and
 Oral Surgery)
 Charles R. Noback, PH.D.
 George K. Smelser, PH.D.
 (Aldrich Professor —
 Ophthalmology)

ASSOCIATE PROFESSOR

Frederic J. Agate, PH.D.
 Philip W. Brandt, PH.D.
 Charles A. Ely, PH.D.

ASSISTANT PROFESSORS

Ernest W. April, PH.D.
 George W. Cooper, PH.D.
 William G. Dilley, PH.D.
 Ray C. Henrikson, PH.D.
 W. Patrick Luckett, PH.D.
 Letty Moss-Salentijn, D.D.S.
 (Oral Biology)
 Mary S. Parshley, PH.D.
 (Obstetrics and Gynecology)
 Gerard P. Pereira, PH.D.
 John J. Rasweiler, IV, PH.D.
 Robert W. Rice, PH.D.
 (Orthopedic Surgery)
 Alfonso Solimene, PH.D.

ADJUNCT ASSISTANT PROFESSORS

Marie D. Felix, PH.D.
 Shih-Chang Shen, PH.D.

RESEARCH ASSOCIATES

Bei-Loo Chen, M.D.
 Robert J. Demarest
 Joseph Reibeisen, B.S.

INSTRUCTOR

Robert M. Hunt, Jr., M.S.

SPECIAL LECTURER

Edmund Applebaum, D.D.S.

Anesthesiology

PROFESSORS

Robert M. Epstein, M.D.
 L. Stanley James, M.D.
 (from Pediatrics)
 Ronald L. Katz, M.D.
 Lester C. Mark, M.D.

PROFESSORS (*continued*)

Gabriel G. Nahas, M.D.
 Shih-Hsun Ngai, M.B.
 (Chairman)
 Herbert Rackow, M.D.

PROFESSOR OF CLINICAL
ANESTHESIOLOGY

Leonard Brand, M.D.
 Edgar C. Hanks, M.D.
 Ernest Salanitri, M.D.
 Herman Schwartz, M.D.

ADJUNCT PROFESSOR

Sidney Spector, M.D.
 (See Pharmacology)

ASSOCIATE PROFESSORS

Mieczyslaw Finster, M.D.
 Johannes H. Karis, M.D.
 Richard W. Patterson, M.D.
 Paul J. Poppers, M.D.
 Stuart F. Sullivan, M.D.

ASSOCIATE PROFESSORS OF CLINICAL
ANESTHESIOLOGY

Lynne T. Greene, M.D.
 Charles E. Wolf, M.D.

ASSISTANT PROFESSORS

Robert T. Donham, M.D.
 Ralph A. Epstein, M.D.
 Jean Henley, M.D.
 Allen I. Hyman, M.D.
 Vance Lauderdale, Jr., M.D.
 Shirley J. Markee, M.D.
 Richard S. Matteo, M.D.
 Hisayo O. Morishima, M.D.
 Eugene J. Pantuck, M.D.
 Hilda Pedersen, M.D.
 Daniel M. Pino, M.D.
 Lubos Triner, M.D.

ASSISTANT PROFESSORS OF CLINICAL
ANESTHESIOLOGY

Veronica Bakamjian, M.D.
 Arnold St. J. Lee, B.A.
 Jordan Miller, M.D.
 J. Gilbert Stone, M.D.

ASSOCIATES

Dorothy A. H. Black, M.D.
 Carolyn P. Greenberg, M.D.
 Krishan Malik, M.D.

RESEARCH ASSOCIATES

Salha S. Daniel, PH.D.
 Iris W. Schwartz, M.D.
 Mariagnes Verosky, B.A.
 Yvonne Vulliemoz, PH.D.

INSTRUCTORS

Gerald L. Feinberg, M.D.
 Hoshang J. Khambatta, M.D.
 Laurence J. Krenis, M.D.
 Alan N. Rachleff, M.D.
 Anthony J. Salvatore, M.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSOR

William F. Karl, M.D.

At Harlem Hospital:

ASSOCIATE CLINICAL PROFESSOR

Herbert G. Cave, M.D.

ASSISTANT CLINICAL PROFESSORS

Samuel C. Brisbane, M.D.
 Oscar N. Graves, M.D.
 Archibald K. Hinds, M.D.
 Gilbert Phanor, M.D.
 Stephanie Shich, M.D.
 Kentaro Tsueda, M.D.
 Francis Weekes, M.D.

INSTRUCTOR

Theodosia H. Mack, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSORS

Ronald A. Andree, M.D.
 Wally Gordon, M.D.
 Richard Keenan, M.D.

INSTRUCTORS

Ignacio U. Ngo, M.D.
 William M. Smith, M.D.

At St. Luke's Hospital:

ASSOCIATE PROFESSOR OF CLINICAL
ANESTHESIOLOGY

Louis S. Blancato, M.D.

ASSISTANT PROFESSORS OF CLINICAL
ANESTHESIOLOGY

Ennio Gallozzi, M.D.
 Errol N. Harding, M.D.

ASSISTANT CLINICAL PROFESSOR

Aino Tuul, M.D.

ASSOCIATES

Joseph Jacovelli, M.D.
 Hilda H. C. Liu, M.D.
 Alfred T. C. Peng, M.D.
 Altagracia H. Polanco, M.D.

INSTRUCTOR

Ming C. Chiou, M.D.

Biochemistry

PROFESSORS

Reinhold Benesch, PH.D.
 Erwin Chargaff, PH.D.
 (Chairman)
 Max A. Eisenberg, PH.D.
 Philip Feigelson, PH.D.
 (Cancer Research)
 Samuel Graff, PH.D.
 Alvin I. Krasna, PH.D.

Seymour Lieberman, PH.D.

(Obstetrics and Gynecology)

Maurice M. Rapport, PH.D.
 (Psychiatry)

David B. Sprinson, PH.D.
 Parithychery R. Srinivasan, PH.D.

PROFESSOR OF BIOCHEMICAL
CRYSTALLOGRAPHY

Barbara W. Low, PH.D.

ASSOCIATE PROFESSORS

Ruth E. Benesch, PH.D.
 Allen M. Gold, PH.D.
 Dezider Grunberger, PH.D.
 (Inst. of Cancer Res.)
 John D. Karkas, PH.D.
 David J. Smith, D.D.S.

ASSISTANT PROFESSORS

George Alexander, PH.D.
 (Psychiatry)
 Elinor F. Brunngraber, PH.D.
 Gerald Cohen, PH.D.
 (Psychiatry)
 Edith G. Gollub, PH.D.
 Irving Goodman, PH.D.
 (Surgery)
 Ronald L. Hanson, PH.D.
 Leon T. Kremzner, PH.D.
 (Neurology)
 Kenneth O. Lloyd, PH.D.
 (Dermatology)
 Ines Mandl, PH.D.
 (Obstetrics and Gynecology)
 Herbert Meltzer, PH.D.
 (Psychiatry)
 Richard W. Moyer, PH.D.
 Terrone L. Rosenberry, PH.D.
 Lawrence E. Skogerson, PH.D.
 Benjamin Weiss, PH.D.
 (Psychiatry)

ADJUNCT ASSISTANT PROFESSOR

Liese L. Abell, PH.D.
 (Medicine)

ASSOCIATES

Richard C. Bray, PH.D.
 (Orthopedic Surgery)
 Ada M. Graff, B.A.

RESEARCH ASSOCIATES

Mella Adlersberg, M.S.
 Jean Dayan, PH.D.
 Herman Kaufman, PH.D.
 (Psychiatry)
 Alemka Kisic, PH.D.
 (Psychiatry)
 Sahebarao P. Mahadik, PH.D.
 Lola Margulies, PH.D.
 V. L. N. Murty, PH.D.
 (Ophthalmology)
 Maeda Nobuji, M.D.
 William Poillon, PH.D.
 (Neurology)

Biochemistry (*continued*)RESEARCH ASSOCIATES (*continued*)

Laura Ponticorvo, PH.D.
 Hugh S. Preston, M.D.
 Ildiko Radicevich, PH.D.
 (Medicine)
 Lawrence S. Rosen, PH.D.
 Carl Rothschild, PH.D.
 Andrew D. Rudko, PH.D.
 Dorothy Srinivasan, PH.D.
 Joannis G. Stravrianopoulos, PH.D.
 Hadassah Tamir, PH.D.
 Natalie P. Trifunao, PH.D.
 Paula E. Zimmering, PH.D.
 (Obstetrics and Gynecology)

SPECIAL LECTURERS

Zacharias Dische, M.D.
 Forrest E. Kendall, PH.D.
 (Medicine)
 Karl Meyer, M.D.
 (Medicine)
 David Nachmansohn, M.D.
 (Neurology)

At Mary Imogene Bassett Hospital:

ASSOCIATE

Theodore Peters, Jr., PH.D.
 (Medicine)

RESEARCH ASSOCIATE

William A. Warren, M.D.

At Harlem Hospital:

ASSISTANT PROFESSOR

Muriel Feigelson, PH.D.
 (Obstetrics and Gynecology)

Dermatology

PROFESSOR

Carl T. Nelson, M.D.
 (Chairman)

CLINICAL PROFESSORS

Anthony N. Domonkos, M.D.
 Saul L. Sanders, M.D.
 Lewis Shapiro, M.D.

ASSOCIATE PROFESSOR

Margareta Silva-Hutner, PH.D.

ASSOCIATE CLINICAL PROFESSOR

Richard A. Walzer, M.D.

ASSISTANT PROFESSOR

Kenneth O. Lloyd, PH.D.
 (from Biochemistry)

ASSISTANT CLINICAL PROFESSORS

Irving Abrahams, M.D.
 Jack Eisert, M.D.
 James P. Fields, M.D.
 Meyer H. Slatkin, M.D.

ASSOCIATE

Marvin Brodey, M.D.

RESEARCH ASSOCIATES

Julia M. Einbinder, M.S.
 Wei-Li S. Lee, PH.D.

INSTRUCTORS

William G. Atwood, M.D.
 Einar A. Juhlin, M.D.
 Theodore A. Labow, M.D.
 William G. Merz, M.D.

ASSISTANTS

Elaine V. Di Grande, M.D.
 Burton S. Koplon, M.D.
 Joseph A. Penner, M.D.
 Jack H. Rozen, M.D.
 Joseph S. Shapiro, M.D.
 Eva B. Stahl, M.D.
 Hilda G. Straker, M.D.
 Karl W. Waterson, M.D.

LECTURER

Arturo L. Carrion, M.D.

SPECIAL LECTURERS

Leslie P. Barker, M.D.
 J. Lowry Miller, M.D.

At Harlem Hospital:

ASSISTANT CLINICAL PROFESSOR

Henry L. Hines, M.D.

At St. Luke's Hospital:

ASSOCIATE CLINICAL PROFESSOR

Alexander W. Young, Jr., M.D.

INSTRUCTOR

Peter C. Lombardo, M.D.

ASSISTANTS

William R. Barbee, M.D.
 Eugene W. Sweeney, M.D.

At Roosevelt Hospital:

ASSISTANT

David Sibulkin, M.D.

**Human Genetics
and Development**

PROFESSORS

Kimball C. Atwood, M.D.
 Georgiana Jagiello, M.D.
 (see Obstetrics and Gynecology)
 Elvin A. Kabat, PH.D.
 (Microbiology)
 Robert S. Krooth, M.D.
 (Chairman)
 Paul A. Marks, M.D.
 (Medicine)
 Orlando J. Miller, M.D.
 (Obstetrics and Gynecology)
 Richard A. Rifkind, M.D.
 (Medicine)

Sol Spiegelman, PH.D.
 (Cancer Research)

PROFESSOR OF CLINICAL PSYCHIATRY

John D. Rainer, M.D.

ADJUNCT PROFESSORS

Sidney Udenfriend, PH.D.
 Arthur Weissbach, PH.D.
 Herbert Weissbach, PH.D.

ASSISTANT PROFESSORS

Mihaly Bartolos, M.D.
 Daniel L. Kacian, PH.D.
 George M. Maniatis, M.D.
 Donald R. Mills, PH.D.
 (Cancer Research)
 Jeffrey Schlom, PH.D.
 Dorothy Warburton, PH.D.

RESEARCH ASSOCIATES

Vaithilingham G. Dev, PH.D.
 Ann S. Henderson, PH.D.
 Julia B. Jones
 Selina C. Kiang
 Donald J. Komma, PH.D.
 George F. Lam, M.S.
 Pamela J. Malfoix, PH.D.
 Dorothy A. Miller, PH.D.
 Francesco Ramirez, PH.D.
 Ming Tsung Yu, PH.D.

INSTRUCTORS

Harold I. Calvin, PH.D.
 David H. Chui, M.D.
 Rudiger Hehlmann, M.D.
 Mosaaki Terada, M.D.

Medicine

PROFESSORS

Stanley E. Bradley, M.D.
 (Bard Professor)
 Robert E. Canfield, M.D.
 Harry W. Fritts, Jr., M.D.
 DeWitt S. Goodman, M.D.
 (Tilden-Weger-Bieler Professor)
 Rejane M. Harvey, M.D.
 Paul A. Marks, M.D.
 (see Human Genetics and
 Development)
 Hymie L. Nossel, M.D.
 Elliott F. Osserman, M.D.
 Charles A. Ragan, M.D.
 (Lambert Professor and
 Chairman)
 Richard A. Rifkind, M.D.
 (see Human Genetics and
 Development)
 John V. Taggart, M.D.
 (see Physiology)
 Donald F. Tapley, M.D.
 (Associate Dean)
 Gerard M. Turino, M.D.
 Arthur R. Wertheim, M.D.

PROFESSORS OF CLINICAL MEDICINE

Henry Aranow, Jr., M.D.
 Felix E. Demartini, M.D.
 M. Irene Ferrer, M.D.
 Julia M. Jones, M.D.
 John H. Laragh, M.D.
 Sidney C. Werner, M.D.

CLINICAL PROFESSORS

Robert J. Glaser, M.D.
 Alfred Steiner, M.D.

ASSOCIATE PROFESSORS

Arthur Bank, M.D.
 J. Thomas Bigger, M.D.
 Vincent P. Butler, M.D.
 Paul J. Cannon, M.D.
 Andrew G. Frantz, M.D.
 John S. Kovach, M.D.
 E. Carwile LeRoy, M.D.
 Harold C. Neu, M.D.
 Ann S. Peterson, M.D.
 (Associate Dean)
 Richard S. Rivlin, M.D.
 I. Bernard Weinstein, M.D.

ASSOCIATE PROFESSORS OF CLINICAL MEDICINE

Stuart W. Cosgriff, M.D.
 Shirley C. Fisk, M.D.
 David J. Gocke, M.D.
 Donald A. Holub, M.D.
 Albert R. Lamb, Jr., M.D.
 Edgar Leifer, M.D.
 George W. Melcher, M.D.
 Kermit L. Pines, M.D.

ASSOCIATE CLINICAL PROFESSORS

Hylan A. Bickerman, M.D.
 John O. Burris, M.D.
 Henry Colcher, M.D.
 Albert W. Grokoest, M.D.
 George A. Hyman, M.D.
 Abbie I. Knowlton, M.D.
 Robert A. Kritzler, M.D.
 George H. McCormack, M.D.
 Jay I. Meltzer, M.D.
 Robert P. Noble, M.D.
 Richard J. Stock, M.D.
 Herbert B. Wilcox, Jr., M.D.
 John A. Wood, M.D.

ASSISTANT PROFESSORS

Leslie Baer, M.D.
 Hans R. Brunner, M.D.
 Peter R. B. Caldwell, M.D.
 Medhi Farhangi, M.D.
 Wylie C. Hembree, M.D.
 (see Obstetrics and Gynecology)
 James A. Kennedy, M.D.
 F. David Kitchin, M.D.
 Roger L. Lerner, M.D.
 John N. Loeb, M.D.
 David J. McConnell, M.D.
 Francis J. Morgan, M.D.
 Thomas Q. Morris, M.D.
 Jane H. Morse, M.D.

Elizabeth R. Prichard, M.S.
 (Medical Social Service)
 Donald H. Schmidt
 Frank R. Smith, M.D.
 Charles Steiner, M.D.
 Henry M. Thomas III, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

John L. Buchanan, M.D.
 Michael H. Cohen, M.D.
 Robert H. De Bellis, M.D.
 Wendell B. Hatfield, M.D.
 William P. Lovejoy, M.D.
 Hans W. Neuberger, M.D.
 Peter E. Schrag, M.D.
 Jeffrey A. Stein, M.D.
 Joseph G. Sweeting, M.D.
 Robert T. Whitlock, M.D.
 Carl R. Wise, M.D.

ASSISTANT CLINICAL PROFESSOR

Casco Alston, M.D.
 Helen M. Anderson, M.D.
 Alfred E. Brewer, M.D.
 Clarence J. D'Alton, M.D.
 Richard B. Duane, Jr., M.D.
 Arthur Feinberg, M.D.
 Paul K. Johnson, M.D.
 Daniel L. Larson, M.D.
 Cornelius J. Tyson, M.D.
 Earl A. Wheaton, Jr., M.D.

ADJUNCT ASSISTANT PROFESSOR

Liese L. Abell, PH.D.
 (from Biochemistry)

ASSOCIATES

Geraldine P. Bradley, M.D.
 M. Edwina Campbell, M.D.
 Daniel S. J. Choy, M.D.
 John M. Daley, M.D.
 Juan G. Edreira, M.D.
 Dorothy Estes, M.D.
 Charles Faverio, M.D.
 Lionel Grossbard, M.D.
 Robert H. Heissenbuttel, M.D.
 George C. Hennig, M.D.
 James A. Hogan, M.D.
 Margaret M. Kilcoyne, M.D.
 Marvin M. Lipman
 Arnold L. Lisio, M.D.
 Kenneth A. McClane, M.D.
 Carmen I. Ortiz Neu, M.D.
 Marshall P. Primack, M.D.
 Edith B. Reilly, M.D.
 Melvin B. Weiss, M.D.

RESEARCH ASSOCIATES

Kathrine J. Baker, M.A.
 Bonnie A. Bray, PH.D.
 Fritz R. Buhler, M.D.
 Kuang Chung Hu Chien, M.D.
 Jaime B. Coelho, M.D.
 Arpad G. Fazekas, M.D.
 Haralambox P. Gavras, M.D.

Irene Gavras, M.D.
 Elizabeth J. Harfenist, M.D.
 Yoshikazu Kanda, PH.D.
 Anantha K. Mallia, PH.D.
 George Mallis, M.D.
 Peter O. Milch, M.D.
 Idliko Radichevich, PH.D.
 (from Biochemistry)
 Victor F. Saldanha, M.D.
 Jean E. Sealey, B.S.
 John E. Smith, PH.D.
 Julio E. Sotelo, M.D.
 Edwin D. Vaughn, Jr., M.D.
 Elaine P. Winshell, PH.D.

INSTRUCTORS

Stewart F. Alexander, M.D.
 Eli Bauman, M.D.
 Martin E. Bloomfield, M.D.
 Ralph S. Blume, M.D.
 Jean E. Collard, M.A.
 (Medical Social Work)
 Neal J. Conan, Jr., M.D.
 James J. Coyne, M.D.
 J. Kirby Cunningham, M.D.
 Agnes D. Dilworth, M.S.S.
 (Medical Social Work)
 Lloyd C. Fisher, M.D.
 Claudio Gerbi, M.D.
 Elsa-Grace Giardina, M.D.
 (Clinical Pharmacology)
 Lonnie B. Hanauer, M.D.
 Ralph J. Herz, M.D.
 Elliott J. Howard, M.D.
 Ginette B. Jacob, M.D.
 Elias M. Kaimakliotis, M.D.
 Constantine P. Ladopoulos, M.D.
 Catherine I. Lang, B.A.
 Daniel L. Macken, M.D.
 James A. L. Mathers, M.D.
 Marc E. Newberg, M.D.
 Eduardo R. Pons, M.D.
 David L. Rosen, M.D.
 Alex Sahagian-Edwards, M.D.
 Nathaniel Selleck, M.D.
 Arthur I. Snyder, M.D.
 Helen Van Alstine, M.D.
 Cristobal A. Vicens, M.D.

ASSISTANTS

Howard J. Barnum, M.D.
 John T. Beaty, M.D.
 Alfred Becker, M.D.
 Paul J. Chrzanowski, M.D.
 James A. Coss, Jr., M.D.
 Helen-Ann Garcia, M.D.
 Irwin Goldstein, M.D.
 John G. Kauderer, M.D.
 Pier Mancuso-Ungaro, M.D.
 Mato L. Marinovich, M.D.
 Michael Meyer, M.D.
 Rene Pecikyan, M.D.
 Milovan T. Rakic, M.D.
 Morris R. Rapoport, M.D.
 Steven R. Rheingold, M.D.

Medicine (continued)**ASSISTANTS (continued)**

John M. Rodgers, M.D.
Theodore J. Stahl, M.D.
Ronald Wallach, M.D.
Stuart H. Young, M.D.

SPECIAL LECTURERS

Andre Cournand, M.D.
Forrest Kendall, M.D.
Karl Meyer, M.D.
(Biochemistry)
Dickinson W. Richards, M.D.

LECTURERS

Edward E. Fischel, M.D.
Vernon M. Ingram, M.D.
John H. McClement, M.D.

At Mary Imogene Bassett Hospital:

ASSOCIATE PROFESSORS OF CLINICAL MEDICINE

John S. Davis, M.D.
Herbert J. Marx, M.D.

ASSOCIATE CLINICAL PROFESSORS

Joseph W. Ferrebee, M.D.
Malcolm I. Page, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Emery C. Herman, M.D.
William H. Mook, M.D.
Robert S. Sioussat, M.D.
David W. Vaules, M.D.

ASSISTANT CLINICAL PROFESSORS

Joseph S. Lunn, M.D.
Donald O. Pollack, M.D.

ASSOCIATE

Theodore Peters, Jr., PH.D.
(from Biochemistry)

INSTRUCTORS

Rene E. Cormier, M.D.
Joshiro Matsuo, M.D.
David S. Svahn, M.D.

At Harlem Hospital:

PROFESSOR

Gerald E. Thomson, M.D.

CLINICAL PROFESSOR

James L. Leland, M.D.

ASSOCIATE PROFESSORS

Yalc Enson, M.D.
John Lindenbaum, M.D.
Dudley F. Rochester, M.D.

ASSOCIATE CLINICAL PROFESSORS

John B. Cromie, M.D.
William R. Cunnick, M.D.
John R. Edsall, M.D.

Cecil G. Marquez, M.D.
William H. Stearns, M.D.
Kenneth Sterling, M.D.

ASSISTANT PROFESSOR

Anne M. Briscoe, PH.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Charles P. Felton, M.D.
Jeanne A. Smith, M.D.

ASSISTANT CLINICAL PROFESSORS

Harold S. Ballard, M.D.
George C. Branche, M.D.
Richard R. Prouty, M.D.
Lewis M. Slater, M.D.
Charles M. Yergan, M.D.

ASSOCIATES

Marcia B. Bull, M.D.
Albert R. Casazza, M.D.
John C. DiJohn, M.D.
Paul Killian, M.D.
Melina L. Lewis, M.D.
Anthony J. Marano, M.D.
Clayton L. Natta, M.D.
Michael R. Rosen
(Pharmacology)

INSTRUCTORS

Elmer Alpert, M.D.
Vernon G. Baker, M.D.
Mack Bonner, Jr., M.D.
Norma Braun, M.D.
Ernest J. DeSalvo, M.D.
Pearl D. Foster, M.D.
Lee B. Reichman, M.D.
Stanford A. Roman, Jr.
Phillip R. Stewart, M.D.
Michael D. Williams, M.D.

ASSISTANTS

Philip W. Brickner, M.D.
Reynard J. McDonald, M.D.
Douglas Miller, M.D.
Robert M. Shepardson, Jr., M.D.
Warren T. Sherman, M.D.

LECTURER

Gerald L. Baum, M.D.

At Roosevelt Hospital:

PROFESSOR

Nicholas P. Christy, M.D.

ASSOCIATE PROFESSORS

A. Gregory Jameson, M.D.
Gerald B. Phillips, M.D.
Harvey J. Weiss, M.D.

ASSOCIATE CLINICAL PROFESSOR

Philip H. Henneman, M.D.

ASSISTANT PROFESSORS

John T. Connell, M.D.
Edward M. Dwyer, III, M.D.

Marianne J. Legato, M.D.
William Rosner, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Albert Attia, M.D.
Henry G. Schaffeld, M.D.
Joyce C. Shaver, M.D.

ASSISTANT CLINICAL PROFESSORS

Kenneth T. Donaldson, M.D.
Stanley R. Fine, M.D.

ASSOCIATES

Richard P. Ames, M.D.
LeClair Bissell, M.D.
Charles A. Bertrand, M.D.
William H. Button, Jr., M.D.
James Ducey, M.D.
Leo B. Halleran, M.D.
Arthur Karanas, M.D.
Myron C. Patterson, M.D.
Bruce Pinkernell, M.D.
Lawrence Scharer, M.D.
Gerald Weintraub, M.D.

RESEARCH ASSOCIATES

Louise L. Phillips, PH.D.
Thomas B. Techo

INSTRUCTORS

Harvey Benovitz, M.D.
Robert Bernot, M.D.
Susan M. Deakins, M.D.
Rosina B. Dixon, M.D.
Robert K. Emy, M.D.
James B. Gabriel, M.D.
Oscar B. Garfein, M.D.
Henry M. Greenberg, M.D.
Jacob D. Matis, M.D.
David K. Meriney, M.D.
Thomas M. Nall, M.D.
Nicholas V. Steiner, M.D.
Robert B. Tator, M.D.
Thornton S. Walker, M.D.
Herman Ziffer, M.D.

ASSISTANTS

Kenneth A. Altmann, M.D.
Michael A. Diamond, M.D.
Antoine C. Harovas, M.D.
William M. Nicholas, M.D.

At St. Luke's Hospital:

PROFESSOR

Theodore B. Van Itallie, M.D.

ASSOCIATE PROFESSORS

John F. Bertles, M.D.
Robert B. Case, M.D.
Peter R. Holt, MD.

ASSOCIATE CLINICAL PROFESSORS

William S. Clark, M.D.
Michael H. Grieco, M.D.
James G. Hilton, M.D.

SENIOR RESEARCH ASSOCIATE

Beatrice M. Fairchild, PH.D.

ASSISTANT PROFESSORS

Robert S. Bernstein, M.D.
 Paul Cushman, M.D.
 Richard N. Pierson, M.D.
 F. Xavier PiSunyer, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

A. Loomis Bell, M.D.
 Harvey G. Kemp, M.D.
 Alice Maniatis, M.D.
 Norton S. Rosensweig, M.D.

ASSISTANT CLINICAL PROFESSORS

Robert S. Beekman, M.D.
 David S. David, M.D.
 Zane H. Gaut, M.D.
 Jonas M. Goldstone, M.D.
 John H. Keating, Jr., M.D.
 Edward H. Reisner, M.D.
 Miles J. Schwartz, M.D.
 Myron Wright, M.D.

ASSOCIATES

Charles G. Adsit, M.D.
 William P. Athos, M.D.
 C. Reddington Barrett, M.D.
 Airlee A. C. Cameron, M.D.
 Gilbert R. Cherrick, M.D.
 Donald P. Dallas, M.D.
 George Dermksian, M.D.
 James A. Feltman, M.D.
 Francis G. Geer, M.D.
 Maurice F. Goodbody, M.D.
 William S. Hopewell, M.D.
 Arthur J. Lennon, M.D.
 Richard S. McCray, M.D.
 Robert B. Roven, M.D.
 Fred J. Schilling, M.D.
 Seiichi, Shimomura, M.D.
 Thomas T. Tamlyn, M.D.

RESEARCH ASSOCIATE

Paul H. Swerdlow

INSTRUCTORS

Eric Andreae, M.D.
 Cecil B. Broderick, M.D.
 Hugh C. Davidson, M.D.
 Dulaney Glen, M.D.
 Richard P. Keating, M.D.
 Benjamin N. Kightlinger, M.D.
 Burton P. McHugh, M.D.

Microbiology

PROFESSORS

Paul D. Ellner, PH.D.
 Bernard F. Erlanger, PH.D.
 Charles L. Fox, M.D.
 (Surgery)

Gabriel C. Godman

(See Pathology)

Elvin A. Kabat, PH.D.
(Neurology)Councilman Morgan, M.D.
(Associate Dean)Harry M. Rose, M.D.
(Borne Professor and Chairman)

Herbert S. Rosenkranz, PH.D.

Stuart W. Tanenbaum, PH.D.

Henry J. Vogel, PH.D.
(Pathology)

ASSOCIATE PROFESSOR

Wladyslaw Manski, SC.D.
(Ophthalmology)

ASSISTANT PROFESSORS

Joe E. Coward, PH.D.
 Tadasu Tokumaru, M.D.
 (Ophthalmology)
 Spyros M. Vratsanos, PH.D.

ASSISTANT CLINICAL PROFESSOR

Arlene D. Deitch, PH.D.
(Pathology)

ASSOCIATE

Louise A. Goode, B.A.

RESEARCH ASSOCIATES

Iris L. Doerr, PH.D.
 Rose R. Feiner, PH.D.
 Eugenia T. Gamboa, PH.D.
 (Neurology)
 Lan Wei Lo, PH.D.
 Norbert Wassermann, ENG.D.

SPECIAL LECTURERS

Konrad C. Hsu, PH.D.
 Beatrice C. Seegal, M.D.

At Harlem Hospital:

ASSISTANT PROFESSOR

Angus C. Sampath, D.SC.
(Pathology)

At Roosevelt Hospital:

ASSISTANT PROFESSOR

Azra Shahidi, PH.D.

RESEARCH ASSOCIATE

Israel Siegel, PH.D.

Neurological Surgery

PROFESSORS OF CLINICAL NEUROLOGICAL SURGERY

Lester A. Mount, M.D.
 (Acting Chairman)
 Edward B. Schlesinger, M.D.

ASSOCIATE PROFESSORS OF CLINICAL NEUROLOGICAL SURGERY

James W. Correll, M.D.
 Edgar M. Housepian, M.D.

ASSISTANT PROFESSORS OF CLINICAL NEUROLOGICAL SURGERY

Thomas J. Bridges, M.D.
 Peter W. Carmel, M.D.
 James G. McMurtry III, M.D.

ASSOCIATES

W. Jost Michelsen, M.D.
 Harvey R. Nova, M.D.

RESEARCH ASSOCIATE

Gerda G. Mayer, PH.D.

INSTRUCTOR

George L. Becker, Jr., M.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSOR

Robert W. Mackie, M.D.

At Harlem Hospital:

ASSOCIATE

Richard B. Raynor, M.D.

INSTRUCTOR

Henry D. Messer, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSOR

Ervin E. Hanson, M.D.

At St. Luke's Hospital:

ASSOCIATE

James E. O. Hughes, M.D.

Neurology

PROFESSORS

Sidney Carter, M.D.
 David Cowen, M.D.
 (Neuropathology)
 Philip E. Duffy, M.D.
 (Neuropathology)
 Roger C. Duvoisin, M.D.
 Sid Gilman, M.D.
 Eli S. Goldensohn, M.D.
 Donald H. Harter, M.D.
 Elvin A. Kabat, PH.D.
 (from Microbiology — see Human Genetics and Development)
 Richard L. Masland, M.D.
 (Moses Professor and Chairman)
 Frederick A. Mettler, M.D.
 (from Anatomy)
 Melvin D. Yahr, M.D.
 (Merritt Professor)
 (Associate Dean)

PROFESSORS OF CLINICAL NEUROLOGY

Daniel Sciarra, M.D.
 Carmine T. Vicale, M.D.

CLINICAL PROFESSOR

Arnold P. Friedman, M.D.

Neurology (*continued*)

ASSOCIATE PROFESSORS

Soll Berl, M.D.
(Neurochemistry)
Lucien Cote, M.D.
Lester M. Geller, PH.D.
(Neuropathology)
Arthur Karlin, PH.D.
(from Physiology)
Robert E. Lovelace, M.D.
John P. Reuben, PH.D.
(Physiology)
Virginia M. Tennyson, PH.D.
(Neuropathology)

ASSOCIATE PROFESSORS OF
CLINICAL NEUROLOGY

Abe Chutorian, M.D.
(Pediatrics)
Arnold P. Gold, M.D.
(Pediatrics)
James F. Hammill, M.D.

ASSOCIATE CLINICAL PROFESSORS

Joseph G. Chusid, M.D.
Niels L. Low, M.D.
(Pediatrics)
Rita G. Rudel, PH.D.
(Medical Psychology)
Samuel F. Thomas, M.D.

ASSISTANT PROFESSORS

Robert E. Barrett, M.D.
Florry P. Bowen, PH.D.
Sara Ginsburg, PH.D.
George M. Katz, B.E.E.
M. Richard Koenigsberger, M.D.
(Pediatrics)
Leon T. Kremzner, PH.D.
(from Biochemistry)
Luis A. Marco, M.D.
Terrone L. Rosenberry, PH.D.
(from Biochemistry)
Earl A. Zimmerman, M.D.

ASSISTANT PROFESSORS OF CLINICAL
NEUROLOGY

Robert A. deNapoli, M.D.
Joseph L. O'Brien, M.D.
Myrna J. Schear, M.D.
Margaret R. Seiden, M.D.

ASSISTANT CLINICAL PROFESSORS

Jason W. Brown, M.D.
Hyman G. Weitzen, M.D.

ASSOCIATES

Frank K. Boschenstein, M.D.
Sidney M. Cohen, M.D.
James F. Culleton, M.D.
Martha B. Denckla, M.D.
Stanley Lesse, M.D.
Geoffrey F. Osler, M.D.
David L. Sagman, M.D.
Leonard Zablow, M.A.

RESEARCH ASSOCIATES

Hai Won Chang, PH.D.
David A. Cowburn, PH.D.
Eugenia T. Gamboa
(Microbiology)
Richard E. Heikkila, M.D.
Masataka Kawai, PH.D.
Mary W. Masland, M.S.
(from Otolaryngology)
William J. Nicklas, PH.D.
William D. Niemi, PH.D.
Charles E. Pippenger, PH.D.
William Poillon, PH.D.
(from Biochemistry)
Sidney Steinberg, B.A.
I. M. Tarlov, M.D.

INSTRUCTORS

Robert A. Esser, M.D.
Edward J. Hart, M.D.
Linda Lewis, M.D.
Michael Sananman, M.D.
Philip C. Su, M.D.

ASSISTANTS

Dennis Brown, M.D.
Yueh-Tsun Chen, PH.D.
Canagasoorian Mahendran, M.D.

SPECIAL LECTURERS

Harry Grundfest, PH.D.
David Nachmansohn, M.D.
(from Biochemistry)
Abner Wolf, M.D.
(Neuropathology)

LECTURER

Alexander Mauro, PH.D.

At Mary Imogene Bassett Hospital:

ASSOCIATE CLINICAL PROFESSOR
William Amols, M.D.

At Harlem Hospital:

ASSOCIATE CLINICAL PROFESSOR
Ralph W. Richter, M.D.

ASSISTANT PROFESSOR

John C. M. Brust, Jr., M.D.

INSTRUCTORS

Peggy Ann Alsup, M.D.
Alfred C. Bannerman, M.D.
Bertel Bruun, M.D.

At St. Luke's Hospital:

INSTRUCTOR
Carl W. Braun, M.D.

Nursing

PROFESSORS

Mary I. Crawford, ED.D.
(Chairman)
Helen F. Pettit, M.A.
(Assistant Dean)

ASSOCIATE PROFESSORS

Constance P. Cleary, M.A.
Anna M. Earle, ED.D.

ASSOCIATE PROFESSOR OF
CLINICAL NURSING

Elsa Poslusny, M.A.

ASSISTANT PROFESSORS

Mary R. Barone, M.A.
Mary X. Britten, M.A.
Elizabeth W. Carter, M.A.
Bernice R. Derby, M.S.
Virginia Ehmann, M.A.
Charmaine McM. Fitzig, M.S.
Maurice A. Gates, ED.M.
Martha E. Haber, M.A.
Linda K. Hamlin, M.S.
Rose M. Hoynak, M.A.
Linbania Jacobson, M.S.
Fern Kumler, M.S.
Mary P. Lind, M.S.
Susan C. Maines, M.A.
Jane F. McConville, M.A.
Eunice Messler, M.A.
Constance B. Ort, M.A.
Sandra J. Regenie, M.A.
Nancy M. Sargis, M.A.
Barbara J. Scheyer, M.A.
Sarah L. Sheets, ED.M.
Mary E. Windrow, M.A.
Edwin O. Wray, M.A.

ASSISTANT PROFESSORS OF CLINICAL
NURSING

Carole A. Kaufmann, M.S.
Loretta A. Verdisco, M.A.

DIRECTOR OF RESIDENCE

Rosemary L. Ash, M.A.

ASSISTANT DIRECTOR OF RESIDENCE

Nancy K. Charles, B.S.

ASSOCIATES

Patricia Blagman, M.S.
Marjorie A. Bredice, M.S.
Francesca Castronovo, M.A.
Keville Frederickson, B.S.
Gay F. Gilbert, M.S.
Eura M. Lennon, M.S.
Geraldine M. Lynch, M.A.
Katherine E. Mahoncy, M.S.
Jeanne B. Murray, M.S.
Smitri Pawar, M.A.
Mary V. Smith, M.A.
Aurora D. Villafuerta, M.S.
Lucy D. Warren, M.A.

RESEARCH ASSOCIATE

Bettie S. Jackson, M.A.

INSTRUCTORS

Nancy J. Adels, M.S.
Doris Barker, B.S.
Patricia A. Beaulieu, B.A.

INSTRUCTORS

Andrea J. Benovitch, B.A.
 Mary I. Brooks, B.S.
 Pamela J. Dadac, B.S.
 Sylvia A. M. Delaney, B.S.
 Ann M. Deutsch, M.A.
 Harriet A. Fields, ED.N.
 Carol J. Foy, M.A.
 Karin E. Freas, M.A.
 Margaret A. Kelley, M.A.
 Aleta Kinley, B.A.
 Muriel F. Kneeshaw, B.S.N.
 Pauline Krajewski, M.A.
 Melvina J. Lohmann, M.S.
 Lucille D. Manning, B.S.
 Miriam A. McCormick, B.S.
 Irene C. McEachern, M.S.
 Priscilla C. Parke, M.N.
 Suzanne M. Schimpeler, M.N.
 Bonita P. Schultz, M.A.
 Ann M. Wharton, B.S.
 Carolyn Wrubel, M.S.

At Harlem Hospital:

ASSISTANT PROFESSOR

Edith B. Benoit, M.A.
 (Nursing Education)

INSTRUCTORS

Nancy C. Brown, M.A.
 Freda C. Bush, M.A.
 John A. Payne, M.A.
 (Psychiatry)
 Anna Stein, M.A.

At Roosevelt Hospital:

INSTRUCTORS

Barbara A. Brennan, M.A.
 Barbara A. Peterson, M.S.
 Eldra Simmons, M.A.

Obstetrics and Gynecology

PROFESSORS

Georgiana Jagiello, M.D.
 (see Human Genetics and
 Development)
 Seymour Lieberman, PH.D.
 (Biochemistry)
 Orlando J. Miller, M.D.
 Ralph M. Richart, M.D.
 (from Pathology)
 Raymond L. Vande Wiele, M.D.
 (Rappleye Professor and
 Chairman)

PROFESSORS OF CLINICAL OBSTETRICS
AND GYNECOLOGY

Henry C. Frick, M.D.
 Robert S. Neuwirth, M.D.
 Charles M. Steer, M.D.

CLINICAL PROFESSOR

Equinn W. Munnell, M.D.

ASSOCIATE PROFESSOR

Elizabeth B. Connell, M.D.

ASSOCIATE PROFESSORS OF CLINICAL
OBSTETRICS AND GYNECOLOGY

Robert E. Hall, M.D.
 Gilbert J. Vosburgh, M.D.
 Susan W. Williamson, M.D.

ASSOCIATE CLINICAL PROFESSORS

David B. Moore, M.D.
 W. Duane Todd, M.D.

ASSISTANT PROFESSORS

Edward T. Bowe, M.D.
 Wylie Hembree, M.D.
 (see Medicine)
 Raphael Jewelewicz, M.D.
 Ines Mandl, PH.D.
 (Biochemistry)
 Mary S. Parshley, PH.D.
 (Anatomy)

ASSISTANT PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY

Harold Speert, M.D.

ASSISTANT CLINICAL PROFESSORS

Solan Chao, M.D.
 Vincent J. Freda, M.D.
 (Pathology)
 Dean J. Grandin, M.D.
 Raymond M. McCaffrey, M.D.
 Anne B. Pierson, M.D.
 Landrum B. Shettles, M.D.
 Wolfgang Tretter, M.D.

RESEARCH ASSOCIATES

Penelope W. Allerdice, PH.D.
 Lajos Bandy, M.S.
 Carlton E. Blackwood, PH.D.
 Fred Chasalow, PH.D.
 Inge Dyrenfurth, M.D.
 Michel Ferin, M.D.
 Richard Hochberg, PH.D.
 Stephen Keller, PH.D.
 Paula E. Zimmering, PH.D.
 (from Biochemistry)

INSTRUCTOR

Ming-Neng Yeh, PH.D.

ASSISTANTS

Hussein K. Amin, M.B.
 Lillian D. Nash, M.D.
 Lawrence J. Severino, M.D.

LECTURERS

Arnold N. Fenton, M.D.
 John L. Lewis, Jr., M.D.
 Anna L. Southam, M.D.
 Christopher Tietze, M.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSORS

Richard A. Andresen, M.D.
 Douglas H. Barns, M.D.

At Harlem Hospital:

ASSOCIATE CLINICAL PROFESSOR

Robert D. Patchell, M.D.

ASSISTANT PROFESSORS

Muriel Feigelson, PH.D.
 (from Biochemistry)
 Trishit K. Mukherjee, M.D.

ASSISTANT PROFESSORS OF CLINICAL
OBSTETRICS AND GYNECOLOGY

Young Sook Cho, M.D.
 Meredith Sirmans, M.D.

ASSISTANT CLINICAL PROFESSORS

Hiroko T. Felton, M.D.
 Michael M. Levi, M.D.
 Stephen L. Matseoane, M.D.

INSTRUCTORS

Marc A. Jerome, M.D.
 Nomenida A. Lazaro, M.D.
 Alberto M. Lomeo, M.D.
 Noel D. Mohammed, M.D.
 Alfred J. Williams, M.D.

ASSOCIATE

Sunthorn Bunyaviroch

RESEARCH ASSOCIATE

Ajit K. Goswami

At Roosevelt Hospital:

PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY

Thomas F. Dillon, M.D.

ASSOCIATE PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY

Abraham Risk, M.D.

ASSISTANT CLINICAL PROFESSORS

Margot Ammann, M.D.
 Irwin Chabon, M.D.
 Alexander Coman, M.D.
 John F. Dwyer, M.D.
 Ivan V. Jacobson, M.D.
 Marcia L. Storch, M.D.
 Riley W. Waller, M.D.

ASSOCIATE

Ernst G. Bartsich

INSTRUCTORS

Bernardo Handszer, M.D.
 Terusaoa Horiguchi, M.D.
 Carmine Spedaliere, M.D.
 Fouad Surer, M.B.

At St. Luke's Hospital:

PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY

Harold M. M. Tovell, M.D.

CLINICAL PROFESSOR

Carl T. Javert, M.D.

Obstetrics and Gynecology (continued)

ASSISTANT PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY

Lajos I. von Micsky, M.D.

ASSISTANT CLINICAL PROFESSOR

Tawfik H. Rizkallah, M.D.

ASSOCIATE

Ian G. Van Praagh, M.D.

RESEARCH ASSOCIATE

William G. Kelly, PH.D.
(from Pharmacology)

INSTRUCTOR

Paul Filipescu

Ophthalmology

PROFESSORS

Arthur Gerard DeVoe, M.D.
(Harkness Professor and
Chairman)

George K. Smelser, PH.D.
(Aldrich Professor)
(Anatomy)

ASSOCIATE PROFESSORS

Kenneth E. Eakins, PH.D.
Takeo Iwamoto, M.D.
Wladyslaw Manski, D.Sc.
(from Microbiology)
Abraham Spector, PH.D.
Paul Witkovsky, PH.D.
(from Physiology)

ASSOCIATE PROFESSORS OF CLINICAL
OPHTHALMOLOGY

Charles J. Campbell, M.D.
Philip Knapp, M.D.
George R. Merriam, Jr., M.D.

ASSOCIATE CLINICAL PROFESSORS

Robert M. Day, M.D.
Ira S. Jones, M.D.

ASSISTANT PROFESSORS

Laszlo Z. Bito, PH.D.
Hernando Cardona, M.D.
Jorge Fischbarg, PH.D.
Max Forbes, M.D.
Joe G. Hollyfield, PH.D.
Lu-Ku Li, PH.D.
Victoria Ozanics, M.S.
Tadasu Tokumaru, M.D.
(from Microbiology)

ASSISTANT PROFESSORS OF CLINICAL
OPHTHALMOLOGY

Andrew deRoethth, Jr., M.D.
Anthony Donn, M.D.
Robert M. Ellsworth, M.D.
John W. Espy, M.D.
Arnold W. Forrcst, M.D.
George M. Howard, M.D.
Francis A. L'Esperance, M.D.
Harold F. Spalter, M.D.

ASSISTANT CLINICAL PROFESSOR

Ellen F. Regan, M.D.

ASSOCIATES

Ethel I. Anderson, PH.D.
John Chen, M.D.
D. Jackson Coleman, M.D.
William C. Cooper, M.D.
Richard W. Darrell, M.D.
R. Linsy Farris, M.D.
Frank B. Hoeffle, M.D.
Sally Moore, M.S.
Stephen L. Trokel, M.D.
Emil Wirosko, M.D.

RESEARCH ASSOCIATES

Milton M. Kaplan, D. Optom.
(Physiological Optics)
V. L. N. Murty, PH.D.
(Biochemistry)

INSTRUCTORS

Myles M. Behrens, M.D.
Richard J. Kossman, M.D.
Hugh Moss, M.D.

ASSISTANTS

Milton F. Campbell, M.D.
Richard G. Lennon, M.D.
Thaddeus L. Wandel, M.D.

SPECIAL LECTURERS

Emil G. Bethke, B.A.
Gordon M. Bruce, M.D.
Frank D. Carroll, M.D.
Zacharias Dische, M.D.
(from Biochemistry)
M. Catherine Rittler, B.A.

LECTURER

Charles J. Koester, PH.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSOR
Thomas A. Farrell, M.D.

At Harlem Hospital:

ASSOCIATE

Herman C. Jordan, M.D.

At St. Luke's Hospital

ASSISTANT PROFESSOR OF CLINICAL
OPHTHALMOLOGY

James C. Newton, M.D.

Orthopedic Surgery

PROFESSORS

C. Andrew L. Bassett, M.D.
Frank E. Stinchfield, M.D.
(Chairman)

PROFESSORS OF CLINICAL
ORTHOPEDIC SURGERY

Robert E. Carroll, M.D.
Alexander Garcia, M.D.
Charles S. Neer, II, M.D.
Charles T. Ryder, M.D.

ASSOCIATE PROFESSOR

Austin D. Johnston, M.D.
(from Pathology)

ASSOCIATE PROFESSORS OF CLINICAL
ORTHOPEDIC SURGERY

George B. Ambrose, M.D.
Sawnie R. Gaston, M.D.
S. Ashby Grantham, M.D.

ASSISTANT PROFESSORS OF CLINICAL
ORTHOPEDIC SURGERY

David L. Andrews, M.D.
Harold M. Dick, M.D.
Nasseroddin S. Eftekhari, M.D.
Hugo A. Keim, M.D.
Robert S. Mathews, M.D.

ASSISTANT CLINICAL PROFESSORS

Everett C. Bragg, M.D.
Rosamond Kane, M.D.
D. Keith McElroy, M.D.
Robert M. Reiss, M.D.

ASSISTANT PROFESSOR OF ANATOMY

Robert W. Rice, PH.D.

ASSOCIATE

Richard C. Bray, PH.D.
(from Biochemistry)

RESEARCH ASSOCIATE

Denis Moran, PH.D.

INSTRUCTORS

William U. Cavallaro, M.D.
Chauncey H. Dobson, M.D.
Richard L. Fenton, M.D.
William G. Hamilton, M.D.
Merle H. Katzman, M.D.
Abraham C. Kowarsky, M.D.
Wilfred Krom, M.D.
Harvey Orlin, M.D.
Joseph E. Salvatore, M.D.
William A. Sinton, M.D.
L. Arne Skilbred, M.D.
Martin L. Sorger, M.D.
Joel D. Weinstein, M.D.
Joseph P. Zawadsky, M.D.
Eric K. Zitzmann, M.D.

At Harlem Hospital:

ASSOCIATE PROFESSOR OF CLINICAL
ORTHOPEDIC SURGERY

Marvin L. Shelton, M.D.

ASSOCIATE

Aaron A. Gold, M.D.

At New York State Rehabilitation
Hospital:

ASSOCIATE CLINICAL PROFESSOR
Alice L. Garrett, M.D.

ASSISTANT CLINICAL PROFESSORS

Edward B. Leahey, M.D.
Edward M. Wheeler, M.D.

INSTRUCTOR

Peter N. Carbonara, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSORS

Peter La Motte, M.D.

Andrew L. Patterson, M.D.

INSTRUCTOR

James C. Parkes, M.D.

Otolaryngology

PROFESSORS

Daniel C. Baker, Jr., M.D.

(Chairman)

Juergen Tonndorf, M.D.

PROFESSORS OF CLINICAL

OTOLARYNGOLOGY

Milos Basek, M.D.

Robert M. Hui, M.D.

Jules G. Waltner, M.D.

PROFESSOR OF CLINICAL AUDIOLOGY

AND SPEECH PATHOLOGY

Thomas H. Fay, Ph.D.

CLINICAL PROFESSOR

John J. Conley, M.D.

ASSOCIATE PROFESSOR

Shyam M. Khanna, D.R.E.

ASSOCIATE PROFESSOR OF

CLINICAL OTOLARYNGOLOGY

Robin M. Rankow, M.D.

ASSISTANT PROFESSORS OF CLINICAL

OTOLARYNGOLOGY

Olaf Haroldson, Jr., M.D.

Lawrence Savetsky, M.D.

ASSISTANT CLINICAL PROFESSORS

Robert C. Eberle, M.D.

Malcolm H. Schvey, M.D.

ASSOCIATE

Raymond M. Cole, M.D.

Frank V. Mignogna, M.D.

John D. Piro, M.D.

(Prosthetics)

RESEARCH ASSOCIATE

Mary W. Masland, M.S.

INSTRUCTORS

Neville W. Carmical, M.D.

Claudio Crupi, M.D.

R. Russell Lang, M.D.

John Palesty, M.D.

Raymond B. Strauss, M.D.

Peter D. Westerhoff, M.D.

Howard D. Zipper, M.D.

ASSISTANTS

Ronald C. Hamaker, M.D.

At Mary Imogene Bassett Hospital:

ASSOCIATE

William V. Reynolds, M.D.

At Harlem Hospital:

ASSOCIATE CLINICAL PROFESSOR

Errol A. Thompson, M.D.

ASSISTANT PROFESSOR OF SPEECH

AND HEARING

Raphael M. Haller, M.D.

ASSOCIATE

Mehdi Shaari-Tehrani, M.D.

At Roosevelt Hospital:

ASSOCIATE CLINICAL PROFESSOR

John S. Lewis, M.D.

At St. Luke's Hospital:

ASSOCIATE CLINICAL PROFESSOR

Stanley Whitfield, M.B.

INSTRUCTOR

Mauriciu Rodescu, M.D.

Pathology

PROFESSORS

William A. Blanc, M.D.

A. Whitley Branwood, M.D.

David Cowen, M.D.

(Neuropathology)

Philip E. Duffy, M.D.

(Neuropathology)

S. Raymond Gambino, M.D.

Gabriel Godman, M.D.

Donald W. King, M.D.

(Delafeld Professor and

Chairman)

Nathan Lane, M.D.

(Surgical Pathology)

Raffaele Lattes, M.D.

(Surgical Pathology)

Ralph M. Richart, M.D.

(Obstetrics and Gynecology)

Leon Roizin, M.D.

(Neuropathology—from

Psychiatry)

Herbert C. Stoerk, M.D.

Henry J. Vogel, Ph.D.

(from Microbiology)

Sigmund L. Wilens, M.D.

CLINICAL PROFESSORS

John G. Gorman, M.D.

Victor Herbert, M.D.

Janis V. Klavins, M.D.

Lewis Shapiro, M.D.

(Dermatology)

Sheldon C. Sommers, M.D.

Bernard M. Wagner, M.D.

ASSOCIATE PROFESSORS

Lester M. Geller, Ph.D.

(Neuropathology)

Ross M. Grey, D.V.M.

(Comparative Pathology)

Jack W. C. Hagstrom, M.D.

Austin D. Johnston, M.D.

(Orthopedic Surgery)

Mavis Kaufman, M.D.

(Neuropathology—Psychiatry)

Gordon I. Kaye, Ph.D.

(Surgical Pathology)

Robert Pascal, M.D.

Karl Perzin, M.D.

(Surgical Pathology)

Myron Tannenbaum, M.D.

(Urology)

Virginia M. Tennyson, Ph.D.

(Neuropathology)

H. Joachim Wigger, M.D.

(Pediatrics)

Marianne Wolff, M.D.

(Surgical Pathology)

ASSOCIATE CLINICAL PROFESSORS

Irwin A. Almenoff, M.D.

Daniel W. Benninghoff, M.D.

Melvin W. Blake, M.D.

(Oral Pathology)

Donald E. Brown, M.D.

John M. Budinger, M.D.

Robert L. Hirsch, M.D.

Harry L. Joachim, M.D.

Stanley S. Simbonis, M.D.

Harold J. Sobel, M.D.

Richard L. Swarm, M.D.

Myron E. Tracht, M.D.

ASSISTANT PROFESSORS

Thomas A. Blumenfeld, M.D.

(Pediatric Pathology)

Richard F. Defendini, M.D.

(Neuropathology)

Arline D. Deitch, M.D.

Joshua Fierer, M.D.

Louis Fink, M.D.

Reba Goodman, M.D.

Liselotte Graf, M.D.

Lewis A. Johnson, M.D.

Mary E. King, M.D.

William L. McLellan, Ph.D.

Paul P. Sher, M.D.

(Neuropathology)

Philip Tomashefsky, Ph.D.

(Urology)

Ruth H. Vogel, Ph.D.

George D. Wilner, M.D.

ASSISTANT CLINICAL PROFESSORS

Giles G. Allard, M.D.

Lucretia Allen, M.D.

Ernest Baden, M.D.

William Bernhard, M.D.

Ada B. de Chabon, M.D.

Pathology (continued)**ASSISTANT CLINICAL PROFESSORS**

Stefan E. Epstein, M.D.
 Elliott M. Gross, M.D.
 Don V. Hellerman, M.D.
 Robert S. Matthews, M.D.
 Hiroshi Nakazawa, M.D.
 M. Richard Pachter, M.D.
 William Pollack, PH.D.
 Sarkis S. Sarkisian, M.D.
 Henry G. Schriever, M.D.
 Ralph W. Snyder, M.D.
 Harry H. Stumpf, M.D.
 John A. Terzakis, M.D.
 Paul T. Wertlake, M.D.
 Kaity Yannopoulos, M.D.
 Frederick T. Zugibe, M.D.

ASSOCIATES

Paul Bachner, M.D.
 Herbert Barden
 (Neuropathology)
 Glenna J. Corley, M.D.
 Alvin J. Marx, M.D.
 Doris J. Mitchell, D.V.M.
 Richard F. Sabbia, M.D.
 Robert E. Wenk, M.D.

RESEARCH ASSOCIATES

Vijaya M. Ghanta, PH.D.
 Harry S. Kessler, D.D.S.
 Margaret E. Long, PH.D.
 Robert D. Stebbins, PH.D.
 Gaiko Ueda, PH.D.

INSTRUCTORS

Solange G. Abu Nassar, M.D.
 Alex Ferenczy, M.D.
 Mark R. Mankoff, M.D.
 Robert D. Newman, M.D.
 Joseph E. O'Brien, M.D.
 Moshe Rosen

ASSISTANT

Jane C. Hill, A.B.

SPECIAL LECTURERS

Lester Cahn, D.D.S.
 Jacob Furth, M.D.
 C. Zent Garber, M.D.
 Abner Wolf, M.D.
 (Neuropathology)

LECTURERS

Janis V. Klavins, M.D.
 David Spain, M.D.

At Mary Imogene Bassett Hospital:**CLINICAL PROFESSOR**

Clinton Van Z. Hawn, M.D.

ASSOCIATE CLINICAL PROFESSOR

Charles A. Ashley, M.D.

ASSISTANT CLINICAL PROFESSOR

Lloyd Roberts, M.D.

At Harlem Hospital:**CLINICAL PROFESSOR**

Theophilus Roberts, M.D.

ASSISTANT PROFESSORS

Prem Chauhan, M.D.
 Azak S. Eryol, M.D.
 Carlos Navarro, M.D.
 Angus C. Sampath, D.Sc.
 (from Microbiology)

ASSOCIATES

Doris J. Mitchell, D.V.M.
 John C. Wu, M.D.

INSTRUCTORS

Luritz C. Creque, M.D.
 Mathieu A. Seide, M.D.
 Noel N. Weekes, M.D.

At Roosevelt Hospital:**CLINICAL PROFESSOR**

Rudolf Garret, M.D.

ASSISTANT CLINICAL PROFESSORS

Lazarevio Bozidar, M.D.
 John J. Di Re, M.D.
 Sanford M. Farrer, M.D.
 Martin S. Krumerman, M.D.

At St. Luke's Hospital:**CLINICAL PROFESSOR**

Charles F. Begg, M.D.

ASSISTANT CLINICAL PROFESSORS

Harold P. Gaetz, M.D.
 Artemis D. Nash, M.D.
 Stephen Ryan, M.D.

INSTRUCTORS

Petra E. P. Banogon, M.D.
 Kendall K. Kane, M.D.
 Corazon S. Sian, M.D.

Pediatrics**PROFESSORS**

Richard E. Behrman, M.D.
 (Chairman)
 William A. Blanc, M.D.
 (from Pathology)
 Edward C. Curnen, Jr., M.D.
 (Carpenter Professor)
 L. Stanley James, M.D.
 (Anesthesiology)
 George I. Lythcott, M.D.
 Myron Winick, M.D.
 (Director of Institute of
 Human Nutrition)
 Robert W. Winters, M.D.
 James A. Wolff, M.D.

ASSOCIATE PROFESSORS

Jo Anne Brasel, M.D.
 Douglas S. Damrosch, M.D.
 Ralph Dell, M.D.

Welton M. Gersony, M.D.
 Rawle M. McIntosh, M.D.
 Gilbert W. Mellin, M.D.
 Robert B. Mellins, M.D.
 Akira Morishima, M.D.
 John F. Nicholson, M.D.
 Katherine Sprunt, M.D.

ASSOCIATE PROFESSOR OF CLINICAL PEDIATRICS

Carolyn R. Denning, M.D.
 Sylvia P. Griffiths, M.D.
 Ruth C. Harris, M.D.

ASSOCIATE PROFESSORS OF CLINICAL NEUROLOGY

Abe M. Chutorian, M.D.
 Arnold P. Gold, M.D.

ASSOCIATE CLINICAL PROFESSORS

Jerry C. Jacobs, M.D.
 Walter R. Kessler, M.D.
 Neils L. Low, M.D.
 (from Neurology)

ASSISTANT PROFESSORS

Russell S. Asnes, M.D.
 Jennifer J. Bell, M.D.
 Thomas A. Blumenfeld, M.D.
 (Pediatric Pathology)
 William J. Davis, M.D.
 John M. Driscoll, M.D.
 Burton Grebin, M.D.
 William C. Heird, M.D.
 Eugene Klenk, M.D.
 M. Richard Koenigsberger, M.D.
 (from Neurology)
 Ehud Krongrad, M.D.
 Martin I. Lorin, M.D.
 David Rush, M.D.
 (Epidemiology)
 Anneliese L. Sitarz, M.D.
 Carl N. Steeg, M.D.

ASSISTANT PROFESSORS OF CLINICAL PEDIATRICS

Marguerite J. Gates, M.D.
 Constance J. Hayes, M.D.

ASSISTANT CLINICAL PROFESSORS

Robert E. Appleby, M.D.
 William A. Bauman, M.D.
 Solomon J. Cohen, M.D.
 Yvonne T. Driscoll, M.D.
 Robert E. Jennings, M.D.
 Joseph E. Kalbacher, M.D.
 John J. Kangos, M.D.
 Chris P. Katsampes, M.D.
 Hunter C. Leake, III, M.D.
 Shirley A. Mayer, M.D.
 Daniel J. Melia, M.D.
 Walter L. Mitchell, M.D.
 Thomas W. Patrick, M.D.
 Herbert Poch, M.D.
 Morton H. Rachelson, M.D.
 Roderick C. Richards, M.D.
 Albert P. Rosen, M.D.
 Jack G. Shiller, M.D.

ASSISTANT CLINICAL PROFESSORS

(continued)

Joseph A. Silverman, M.D.
 William H. Smith, M.D.
 Walter R. Stanekwick, M.D.
 David Stiles, M.D.
 Carl S. Strande, M.D.
 Elizabeth Ufford, M.D.
 Robert West, M.D.
 Robert C. Wheeler, M.D.
 Leo Wilking, M.D.

ASSOCIATES

Rose G. Ames, M.D.
 Alexander Blum, Jr., M.D.
 Mary E. Bradford, M.D.
 Ruth U. Donovan, M.D.
 T. Donald Eisenstein, M.D.
 Jane A. Erganian, M.D.
 Burton M. Feinsmith, M.D.
 David N. Franklin, M.D.
 Pureza F. M. Gaerlan, M.D.
 Gustave Gavis, M.D.
 Thurman B. Givan, Jr., M.D.
 Stephen Glaser, M.D.
 I. Bruce Gordon, M.D.
 Bertram H. Grossman, M.D.
 Martin H. Jacobs, M.D.
 Dean N. Martin, M.D.
 Celia Ores, M.D.
 Jane Pitt, M.D.
 Margaret M. Rice, M.D.
 John S. Rosmaita, M.D.
 Robert M. Schwartz, M.D.
 Narayan R. Shah, M.D.
 Gilbert Simon, M.D.
 Elizabeth F. Turnauer, M.D.
 Martin B. Vita, M.D.
 William W. Whitten, M.D.

RESEARCH ASSOCIATES

William B. Bell, M.D.
 Robert A. Herzlinger, M.D.
 Grace A. Leidy, A.B.

INSTRUCTORS

M. David Atkin, M.D.
 Matilda B. Brust, M.D.
 Roger S. Challop, M.D.
 Elizabeth G. Estrin, M.D.
 Bernard R. Feldman, M.D.
 Stanley H. Gilbert, Jr., M.D.
 Jeannette J. Jansky, M.S.
 Betty C. M. L. Kuo, M.D.
 Sajid Maqbool, M.D.
 Stanley G. Morrison, M.D.
 Mary R. Richards, M.D.
 Edith M. J. Kuo-Ying Shen, M.D.

ASSISTANTS

Martha L. Amarant, M.D.
 Alma T. Blitz, M.D.
 Jacob Boris, M.D.
 Kathleen F. Catalano, M.D.
 Bernard Etra, M.D.
 Michael L. Lapkin, M.D.

Gerald Lieberman, M.D.
 Carolkay Lissenden, M.D.
 Mohamad Pourfar, M.D.
 Louis Rodrigues, M.D.
 Rosalinda Rubinsztain, M.D.
 Pradeep Sharma, M.D.
 Kung-tso Sheng, M.D.
 Preston Zucker, M.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSORS
 Joe H. Cannon, M.D.
 Arthur E. Laidlaw, M.D.

ASSOCIATES

Allan S. Cunningham, M.D.
 John G. Freehafer, M.D.

At Harlem Hospital:

CLINICAL PROFESSORS
 Erich J. Kahn, M.D.
 Calvin H. Sinnette, M.D.

ASSOCIATE CLINICAL PROFESSORS

Hugh E. Evans, M.D.
 Gene A. Polk, M.D.

ASSISTANT PROFESSOR

Vivian R. Iglehart, M.D.

ASSISTANT CLINICAL PROFESSORS

Leonard Glass, M.D.
 Lucille C. Gunning, M.D.
 (from Rehabilitation Medicine)
 Wiener LeBlanc, M.D.

ASSISTANTS

Araceli R. Ancajas, M.D.
 Dolores J. Gayle-Thompson, M.D.
 Benamanahalli Rajegowda, M.D.
 Claudine Y. Wallace, M.D.

At Roosevelt Hospital:

ASSISTANT PROFESSOR OF CLINICAL
 PEDIATRICS

Cyril A. L. Abrams, M.D.

ASSISTANT CLINICAL PROFESSORS

Anastasios Anastasiades, M.D.
 Carol E. Burnett, M.D.
 Herbert I. Cohen, M.D.
 Joseph Ferrara, M.D.
 Lucia Rudd, M.D.
 Marianne Schwob, M.D.
 Ada Truppin, M.D.

INSTRUCTORS

Margaret L. Ewing, M.D.
 Andrea-Camille V. Giardina, M.D.
 Nathan E. Saint-Amand, M.D.

At St. Luke's Hospital:

PROFESSOR
 Stuart S. Stevenson, M.D.

ASSOCIATE PROFESSOR OF CLINICAL
 PEDIATRICS

Thomas J. Moore, M.D.

ASSISTANT CLINICAL PROFESSORS

Judith E. Frank, M.D.
 Lucy H. Swift, M.D.
 Elizabeth B. Watkins, M.D.
 Doris L. Wethers, M.D.

INSTRUCTORS

Joseph A. Cannaliato, M.D.
 Fadel M. Hochroth, M.D.
 William A. Kaloss, M.D.
 Catherine Lodyjensky, M.D.
 Irwin J. Polk, M.D.

Pharmacology

PROFESSORS

Herbert J. Bartelstone, D.D.S.
 Lowell M. Greenbaum, PH.D.
 Brian F. Hoffman, M.D.
 (Hosack Professor and Chairman)
 Frederick G. Hofmann, PH.D.
 Wilbur H. Sawyer, M.D.
 Shih-Chun Wang, M.D.

ADJUNCT PROFESSORS

Howard Sachs, PH.D.
 Jurg A. Schneider, M.D.
 Sidney Spector, PH.D.
 (see Anesthesiology)

ASSOCIATE PROFESSORS

Norman Kahn, D.D.S.
 Hsueh-Hwa Wang, M.D.

ADJUNCT ASSOCIATE PROFESSOR

Paul F. Cranefield, M.D.

ASSISTANT PROFESSORS

Arthur L. Bassett, M.D.
 Edward B. Kirsten, M.D.
 Lance L. Simpson, M.D.
 (Psychiatry)
 Andrew L. Wit, PH.D.

ADJUNCT ASSISTANT PROFESSORS

Marvin R. Blumenthal, M.D.
 Martin M. Winbury, PH.D.

ASSOCIATES

Elizabeth E. LeBourhis, PH.D.
 Michael R. Rosen, M.D.
 (Medicine)

RESEARCH ASSOCIATES

F. James Brennan, M.D.
 Herman O. Klein, M.D.
 Joel Kupersmith, PH.D.
 (Surgery)
 Toru Niinaka, D.M.S.
 Hiroko Nishimura, PH.D.
 Samuel M. Ross, B.E.E.
 Alan Saroff, M.D.
 (Surgery)
 Daniel Weinberg, PH.D.
 Robert M. Weiss, M.D.

INSTRUCTOR

Peter K. T. Pang, PH.D.

Pharmacology (continued)

At St. Luke's Hospital:

RESEARCH ASSOCIATE

William G. Kelly, PH.D.
(Obstetrics and Gynecology)**Physiology**

PROFESSORS

Shu Chien, M.B.
William L. Nastuk, PH.D.
David Schachter, M.D.
John V. Taggart, M.D.
(Dalton Professor and
Chairman)

ASSOCIATE PROFESSORS

Martin Blank, PH.D.
John S. Britten, M.D.
Louis I. Cizek, M.D.
Raymond Emmers, M.D.
Arthur Karlin, PH.D.
(Neurology)
Mero Nocenti, PH.D.
John P. Reuben, PH.D.
(Neurology)
Paul Witkovsky, PH.D.
(Ophthalmology)

ASSISTANT PROFESSOR

Shunichi Usami, M.D.

RESEARCH ASSOCIATES

Richard E. Abbott, PH.D.
Jack T. Alexander, B.S.
Ellen R. Batt, PH.D.
Szloma Kowarski, M.A.
Peter M. Scholz, M.D.

INSTRUCTOR

Kung-Ming Jan, PH.D.

Psychiatry

PROFESSORS

Arthur C. Carr, PH.D.
(Medical Psychology)
Bruce P. Dohrenwend, PH.D.
(Social Sciences)
Ernest M. Gruenberg, M.D.
(Epidemiology)
Howard F. Hunt, PH.D.
(Medical Psychology)
Lawrence C. Kolb, M.D.
(Chairman)
Maurice M. Rapport, PH.D.
(Biochemistry)
Leon Roizin, M.D.
(Neuropathology)
Leo Srole, PH.D.
(Social Science)
Samuel Sutton, PH.D.
(Medical Psychology)
William N. Thetford, PH.D.
(Medical Psychology)

PROFESSORS OF CLINICAL PSYCHIATRY

H. Donald Dunton, M.D.
Archibald R. Foley, M.D.
(Public Health)
Sidney Malitz, M.D.
John D. Rainer, M.D.
(see Human Genetics
and Development)

CLINICAL PROFESSORS

Arnold Cooper, M.D.
Willard Gaylin, M.D.
Aaron Karush, M.D.
Lionel Ovesey, M.D.
Alberta B. Szalita, M.D.
John J. Weber, M.D.

ASSOCIATE PROFESSORS

W. Crawford Clark, PH.D.
(Medical Psychology)
Mavis Kaufman, M.D.
(from Neuropathology)
Jacques Rutschmann, D.Sc.
(Medical Psychology)

ASSOCIATE PROFESSORS OF CLINICAL PSYCHIATRY

Ronald F. Fieve, M.D.
Lothar Gidro-Frank, M.D.
Murray Glusman, M.D.
Marvin Herz, M.D.
Joseph Jaffe, M.D.
Lissy F. Jarvik, M.D.
Donald S. Kornfeld, M.D.
Robert Michels, M.D.
James H. Ryan, M.D.
Bernard Schoenberg, M.D.
Helen Schucman, PH.D.
(Medical Psychology)

ASSOCIATE CLINICAL PROFESSORS

Kenneth Z. Altschuler, M.D.
James P. Cattell, M.D.
John P. Lambert, M.D.
Stanley R. Lesser, M.D.
Joseph Lubart, M.D.
Roger MacKinnon, M.D.
John F. O'Connor, M.D.
Rita G. Rudel, M.D.
(Medical Psychology)
Daniel Shapiro, M.D.
Herbert Spiegel, M.D.
Bluma Swerdloff, D.S.W.
(Psychiatric Social Work)
Winifred Winikus, M.S.
(Psychiatric Social Work)

ASSISTANT PROFESSORS

George Alexander, PH.D.
(Biochemistry)
Gerald Cohen, PH.D.
(Biochemistry)
Donald Dillon, PH.D.
(Medical Psychology)
Loise Erlcnmeyer-Kimling, PH.D.
John Gibbon, PH.D.
(Medical Psychology)
Barry Gurland, M.D.

Muriel Hammer, M.D.

(Social Sciences)
Donald E. Hutchings, PH.D.
(Medical Psychology)
Maureen B. Kanzler, PH.D.
(Medical Psychology)
Dennis D. Kelly, PH.D.
(Medical Psychology)
Lenore M. Kopeloff, PH.D.
Herbert Meltzer, PH.D.
(Biochemistry)
Lawrence Sharpe, M.D.
Lance L. Simpson, M.D.
(Pharmacology)
David Stern, M.D.
Cornelis L. Stokman, M.D.
(Medical Psychology)
Benjamin Weiss, PH.D.
(Biochemistry)

ASSISTANT PROFESSORS OF CLINICAL PSYCHIATRY

Levon Z. Boyajian, M.D.
David L. Dunner, M.D.
Robert Spitzer, M.D.
Reginald Taylor, M.D.
Ralph N. Wharton, M.D.

ASSISTANT CLINICAL PROFESSORS

Andre B. Ballard, M.D.
Leah Beck, M.D.
Alexander Beller, M.D.
Jules R. Bemporad, M.D.
Milton Berger, M.D.
Hugh Butts, M.D.
Robert J. Campbell, M.D.
Max P. Cohen, M.D.
Louise Coleman, M.D.
John A. Cook, M.D.
DeWitt Crandell, M.D.
Zira DeFries, M.D.
Richard G. Druss, M.D.
Olga Frankel, M.D.
Richard A. Gardner, M.D.
Rodman Gilder, M.D.
Alexander H. Glassman, M.D.
George Gold, M.D.
Jerome D. Goodman, M.D.
Sol L. Goodman, M.D.
Don R. Heacock, M.D.
Herbert Hendin, M.D.
Winslow R. Hunt, M.D.
David Jaffe, M.D.
Norman Lazar, M.D.
Alexander Levay, M.D.
Florence Liben, M.D.
(Psychology)
Mary C. MacKay, M.D.
Helen C. Meyers, M.D.
Ruth Moulton, M.D.
Winfred Overholser, Jr., M.D.
Robert P. Parkin, M.D.
James M. Perel, PH.D.
Alvin H. Polatin, M.D.
Seymour Post, M.D.
Kathryn F. Prescott, M.D.
Jesse Schomer, M.D.

ASSISTANT CLINICAL PROFESSORS *(continued)*

Kendon Smith, M.D.
John A. Sours, M.D.
Aaron Stern, M.D.
Nettie Terestman, M.D.
Milton Viederman, M.D.
Josef H. Weissberg, M.D.
Exie E. Welsch, M.D.
George H. Wilkie, M.D.

ASSOCIATES

John Atchley, M.D.
Burton August, M.D.
Stephen Bennett, M.D.
Paul A. Bradlow, M.D.
John P. Briggs, M.D.
Aurelio Buonanno, M.D.
Paul F. Califano, M.D.
John Cederquist, M.D.
Sonia Charif, M.D.
Leonard Diamond, M.D.
Stephen Firestein, M.D.
David V. Forrest, M.D.
Eugene Forster, M.D.
Eugene Friedberg, M.D.
Lee R. Gardner, M.D.
Louis J. Gilbert, M.D.
Alvin J. Glick, M.D.
Ivan Goldberg, M.D.
Gurston D. Goldin, M.D.
Victor Goldin, M.D.
Fiona Graham, M.B.
Kenneth Greenspan, M.D.
Fred I. Hahn, M.D.
Lloyd A. Hamilton, Jr., M.D.
Stanley S. Heller, M.D.
Morton M. Hodas, M.D.
Clifton M. Howard, M.D.
Frank Jewett, M.D.
Daniel Justman, M.D.
Peter Laderman, M.D.
Charles W. Lamb, M.D.
Frederick Lane, M.D.
Leon Lefer, M.D.
Naomi Leiter, M.D.
Anthony P. Leuzzi, M.D.
Stephen J. Levitan, M.D.
Robert S. Liebert, M.D.
Stanley Lituchy, M.D.
Neil MacLean, M.D.
Eugene M. Martin, M.D.
Philip Mertz, M.D.
Donald I. Meyers, M.D.
Paul W. Mosher, M.D.
Leonard Moss, M.D.
Robert S. Mumford, M.D.
E. Rea Paidoussi, M.D.
David Peretz, M.D.
Ethel Person, M.D.
Raymond Raskin, M.D.
Stephen Reibel, M.D.
Terry C. Rodgers, M.D.
Elias Savitsky, M.D.
Robert Shapiro, M.D.
Charles Siegel, M.D.

Robert Silbert, M.D.
Jerome Steiner, M.D.
Arthur Stein, M.D.
Michael H. Stone, M.D.
Martin E. Weiler, M.D.
Nicholas R. J. Willson, M.D.

RESEARCH ASSOCIATES

Alexander R. Askenasy, M.D.
Ruth Bennett, PH.D.
June Blum, PH.D.
(Medical Genetics)
Richard L. Blumenthal, PH.D.
Roger M. Christenfeld, M.D.
Jean Endicott, M.D.
Judith Eckman, M.D.
Richard S. Feldman, M.D.
Mark Flapan, PH.D.
(Public Health)
Kenneth Frank, PH.D.
Edward L. Greene, M.D.
Ahmed Hakki, M.D.
Joseph H. Herson, M.D.
Denise B. Kandel, M.D.
Herman Kaufman, PH.D.
(Biochemistry)
Mitchell L. Keitzman, M.D.
Alemka Kisic, PH.D.
(Biochemistry)
Burton Lerner, M.D.
(Internatl. Institute for Study of
Human Reproduction)
Morton Levitt, M.D.
Frederick S. Mendelsohn, M.D.
Robert E. Patton, M.D.
Dina D. Paul, M.D.
Stephanie Portnoy, M.D.
Kurt Salzinger, PH.D.
(Medical Psychology)
Suzanne Salzinger, M.D.
Nicholas Samios, M.D.
Martin Schreiber, M.D.
Hadassan Tamir, PH.D.
(Biochemistry)
Michael Tobin, M.E.E.
David Wilder, M.D.
Philip Zeidenberg, M.D.

INSTRUCTORS

Syed Abdullah, M.B.
Peter Aldin, M.D.
Frederic A. Alling, M.D.
Athanasia Balkoura, M.D.
Harold Been, M.D.
Donald C. Bell, M.D.
Robinette N. Bell, M.D.
Estelle P. Bender, M.D.
Anne E. Bernstein, M.D.
Abraham A. Bridger, M.D.
Thomas M. Cassidy, M.D.
Leon Chattah, M.D.
Stanley J. Coen, M.D.
Dennis Dalton, M.D.
Victor Bernal Y Del Rio, M.D.
Harry Diener, M.D.
Harold B. Escoveer, M.D.
Jerry Finkel, M.D.

Anita Fischer, M.A.
Gerald I. Fogel, M.D.
Bruce Forester, M.D.
Richard C. Friedman, M.D.
Iona H. Ginsberg, M.D.
Robert A. Glick, M.D.
Max Goldberg, M.D.
Maurice Golbey, M.D.
Myra S. Hatterer, M.D.
Gregory Heimark, M.D.
Joel S. Hoffman, M.D.
Carlos Ifarraguerri, M.D.
David Iverson, M.D.
James G. Katis, M.D.
Edward Kaufman, M.D.
Augustus F. Kinzel, M.D.
Gabriele Laury, M.D.
Lawrence I. Levitt, M.D.
Brian P. Lipton, M.D.
Virginia Lozzi, M.D.
George W. Luhrmann, M.D.
Josephine D. Martin, M.D.
Michael R. Milano, M.D.
Ira L. Mintz, M.D.
William J. Nape, M.D.
John D. O'Brien, M.D.
Vladimir R. Piskacek, M.D.
Barbara R. Rosenfeld, M.D.
Arnold M. Rothstein, M.D.
M. Bruce Sarlin, M.D.
Lawrence Shaderowsky, M.D.
Edward M. Shelley, M.D.
Arthur Shore, M.D.
Charles F. Spalding, M.D.
Frank Stallone, M.D.
Sanford W. Stein, M.D.
Ruth Szmarag, M.D.
Walter Tuchman, M.D.
Alan J. Tuckman, M.D.

ASSISTANTS

Harry D. Albert, M.D.
Charles Carluccio, M.D.
Diana C. Cook, M.D.
Raymond Devlin, M.D.
Ellen M. Dolganos, M.D.
Aristide H. Esser, M.D.
Norma Hakusa, M.D.
Ann G. Keill, M.D.
Susan Matorin, M.D.
James W. Montgomery, M.D.
William J. Nemon, M.D.
Carol Robinson, M.D.
Helene Schoenfeld, M.D.
Grace C. K. Sum, M.D.

LECTURERS

Courtenay L. Bennett, M.D.
(Public Health)
Henry Brill, M.D.
Henry A. Davidson, M.D.
Barbara S. Dohrenwend, M.D.
Samuel L. Feder, M.D.
Richard J. Glavin, M.D.
Hanna E. Kapit, PH.D.
Alvin Mesnikoff, M.D.

Psychiatry (continued)**LECTURERS (continued)**

George Mora, M.D.
 Francis J. O'Neill, M.D.
 (Public Health)
 Bertram Pepper, M.D.
 Diane Sank, M.D.
 Jay Schulman, M.D.
 Harold F. Searles, M.D.
 Natalie Shainess, M.D.
 John H. Shapiro, M.D.
 Patricia A. Tueting, M.D.

SPECIAL LECTURERS

Benjamin Balser, M.D.
 Viola W. Bernard, M.D.
 George Goldman, M.D.
 George A. Jervis, M.D.
 Henriette R. Klein, M.D.
 Joseph Zubin, M.D.

At Mary Imogene Bassett Hospital:**ASSISTANT CLINICAL PROFESSOR**

Harvey Gurian, M.D.

ASSOCIATES

John E. Denny, M.D.
 Jerry L. Norton, M.D.
 Hugh R. Williams, M.D.

At Creedmoor State Hospital:**ASSISTANT CLINICAL PROFESSOR**

John R. Whittier, M.D.

At Harlem Hospital:**CLINICAL PROFESSOR**

Elizabeth B. Davis, M.D.

ASSOCIATE CLINICAL PROFESSORS

Jack Sheps, M.D.
 Virginia N. Wilking, M.D.

ASSISTANT CLINICAL PROFESSORS

Margaret M. Lawrence, M.D.
 Austin Moore, M.D.

ASSOCIATES

Bruce L. Ballard, M.D.
 Gladys Egri, M.D.
 Peter-Heinrich G. Schween, M.D.
 Sheldon Zimberg, M.D.

INSTRUCTORS

Edmund Chaitman, M.D.
 Barbara C. Gibbs, M.D.
 Gladys C. Halvorsen, M.D.
 J. Trevor Lindo, M.D.
 John W. Rosenberger, M.D.
 Susana L. Van Alstine, M.D.
 Jung Hae Yum, M.D.

At Henry Ittleson Center for Child Psychiatry:**CLINICAL PROFESSOR**

William Goldfarb, M.D.

At Manhattan State Hospital:**ASSOCIATE CLINICAL PROFESSOR**

A. Anthony Arce, M.D.

ASSISTANT CLINICAL PROFESSOR

Paul Hecht, M.D.
 John A. Talbott, M.D.

INSTRUCTOR

Donald F. Mesece, M.D.

ASSISTANT

Stuart Marcus, M.D.

At Rockland State Hospital:**ASSOCIATE CLINICAL PROFESSOR**

Nathan Kline, M.D.

ASSISTANT

George Simpson, M.D.

RESEARCH ASSISTANT

Per B. Vestergaard, M.D.

At Roosevelt Hospital:**CLINICAL PROFESSOR**

Bernard L. Pacella, M.D.
 Harley C. Shands, M.D.

ASSISTANT CLINICAL PROFESSOR

Arthur N. Avella, M.D.
 Noble A. Endicott, M.D.
 Bernard H. Hall, M.D.
 Steven E. Katz, M.D.
 Harry R. Potter, M.D.
 Herbert M. Rabin, M.D.
 (Medical Psychology)
 Arthur Weider, PH.D.
 (Medical Psychology)

ASSOCIATES

William H. Brownlee, M.D.
 Aaron H. Esman, M.D.
 Blanche Glass, M.D.
 (Medical Psychology)
 Justin L. Greene, M.D.
 David A. Kahn, M.D.
 Richard G. Kopff, Jr., M.D.
 Jeffrey Kramer, M.D.
 Alma Levinson, M.D.
 (Medical Psychology)
 Martin I. Lubin, M.D.
 Joseph T. Martorano, M.D.
 Mitchell S. Rosenthal, M.D.
 George Satran, M.D.
 Robert D. Scharf, M.D.
 William D. Wheat, M.D.

INSTRUCTORS

Norman V. Balinon, M.D.
 Helen A. Derosis, M.D.
 G. Alden Ellison, M.D.
 Sonia W. Hymman, M.D.
 Edward W. Kloth, M.D.
 Woon Soon Lee, M.D.
 Donald J. Mayerson, M.D.
 Arthur M. Perlman, M.D.
 Barry L. Singer, M.D.

ASSISTANTS

Gail B. Allen, M.D.
 Arline C. Caldwell, M.D.
 John Davis, M.D.
 Allan D. Gordon, M.D.
 Peter A. Howland, M.D.
 Robert L. Meineker, M.D.
 Maximo R. Monterrey, M.D.
 Andrzej Nikonorow, M.D.
 Nestor J. Totero, M.D.
 David S. Weinberger, M.D.

At St. Luke's Hospital:**CLINICAL PROFESSOR**

John Cotton, M.D.

ASSISTANT CLINICAL PROFESSOR

Eugene B. Feigelson, M.D.
 Clarice J. Kestenbaum, M.D.
 David M. MacDonald, M.D.
 John A. Milici, M.D.
 George O. Papanek, M.D.

ASSOCIATES

Alex Caemmerer, Jr., M.D.
 Samuel C. Klagsbrun, M.D.
 Melvin M. Udel, M.D.

INSTRUCTORS

Hector R. Bird, M.D.
 James L. Cadden, M.D.
 Irene Chiarandini, M.D.
 Richard C. Conroy, M.D.
 Victor D'Arc, M.D.
 Nathaniel Donson, M.D.
 James H. Egan, M.D.
 Louis Padovano, M.D.
 Sirgay Sanger, M.D.
 Bernardo S. Scheimberg, M.D.
 Henry I. Spitz, M.D.

ASSISTANT

Kenneth M. Berc, M.D.

Public Health**PROFESSORS**

Arne C. V. Barkhuus, M.D.
 (Public Health Practice)
 Lowell E. Bellin, M.D.
 (Health Administrator)
 John H. Bryant, M.D.
 (Chairman)
 Jack Elinson, PH.D.
 (Sociomedical Sciences)
 John W. Fertig, PH.D.
 (Biostatistics)
 Ernest M. Gruenberg, M.D.
 (Epidemiology — from Psychiatry)
 Kathleen L. Hussey, PH.D.
 (Parasitology)
 Michael Katz, M.D.
 (Tropical Medicine)
 Thomas S. Langner, PH.D.
 (Epidemiology)

PROFESSORS (continued)

- Mervyn W. Susser, M.D.
(Epidemiology)
Frank W. van Dyke, M.S.
(Administrative Medicine)
Roger W. Williams, PH.D.
(Medical Entomology)
Samuel M. Wishik, M.D.
(Public Health Practice)
PROFESSOR OF CLINICAL PSYCHIATRY
Archie R. Foley, M.D.

ADJUNCT PROFESSORS

- Albert J. Beckmann, M.D.
(Public Health Practice)
Myron Brin, M.D.
(Public Health Nutrition)
Robert H. Hamlin, M.D.
(Health Administration)
Frank W. Mount, M.D.
(Epidemiology)
Frederick W. Nordsiek, PH.D.
(Public Health Nutrition)
Bernard L. Oser, PH.D.
(Public Health Nutrition)
Benjamin Pasamanick, M.D.
(Epidemiology)
Nora Piore, M.A.
(Health Economics)
Howard B. Shookhoff, M.D.
(Tropical Medicine)
Ernest L. Wynder, M.D.
(Public Health Practice)

ASSOCIATE PROFESSORS

- Agnes P. Berger, PH.D.
(Biostatistics)
Virginia M. Brown, M.S.
(Administrative Medicine)
Stanley Budner, PH.D.
(Sociomedical Sciences)
Bernard D. Challenor, M.D.
(Epidemiology)
John L. Colombotos, PH.D.
(Sociomedical Sciences)
Elinor F. Downs, M.D.
(Public Health Practice)
Frances R. Gearing, M.D.
(Epidemiology)
Allen D. Ginsberg, PH.D.
(Health Administration)
Sami A. Hashim, M.D.
(Public Health Nutrition)
Eric Josephson, PH.D.
(Sociomedical Sciences)
Granville H. Sewell, PH.D.
(Environmental Health)
Zena A. Stein, M.D.
(Epidemiology)
Elmer L. Struening, PH.D.
(Epidemiology)
William C. Thomas, PH.D.
(Public Health Practice)
Andre A. O. Varma, M.D.
(Biostatistics)

SENIOR RESEARCH ASSOCIATES

- Lillian M. Belmont, PH.D.
(Epidemiology)
Ann F. Brunswick, M.A.
(Sociomedical Sciences)
Neal W. Chilton, D.D.S.
(Biostatistics)
Paul W. Haberman
(Sociomedical Sciences)
Moni Nag
(International Institute Study
of Human Reproduction)
Gerhart H. Saenger, PH.D.
(Epidemiology)

ADJUNCT ASSOCIATE PROFESSORS

- Emanuel Bund, J.S.C.D.
(Public Health Law)
Ashton C. Cuckler, PH.D.
(Parasitology)
Carl L. Erhardt, SC.D.
(Biostatistics)
Morton A. Fisher, D.D.S.
(Health Administration)
Joseph L. Fleiss, PH.D.
(Biostatistics)
Irving J. Greenblatt, PH.D.
(Occupational Medicine)
Hollis S. Ingraham, M.D.
(Public Health Practice)
James R. Kimmey, M.D.
(Public Health Practice)
Eugene D. Rosenfeld, M.D.
(Administrative Medicine)
Charles G. Roswell, LL.B.
(Administrative Medicine)
Irving S. Shapiro, PH.D.
(Public Health Education)
Vernon F. Spencer, M.S.
(Administrative Medicine)

ASSISTANT PROFESSORS

- Margery M. Braren, PH.D.
(Sociomedical Sciences)
Gloria L. A. Dammann, M.P.H.
(Public Health Nursing)
Dickinson D. Despommier, M.D.
(Parasitology)
Robert H. Friis, M.D.
(Epidemiology)
Harold Fruchtbaum, PH.D.
(History and Philosophy of
Public Health)
Anna K. Gelman
(Epidemiology)
Joanne C. Gersten, PH.D.
(Epidemiology)
Seth B. Goldsmith, SC.D.
(Health Administration)
Donald W. Helbig, M.D.
(Health Administration)
Francis C. Lindaman, M.A.
(Public Health Practice)
(Continuation Education)
Regina Loewenstein, M.D.
(Administrative Medicine)

- Beatrice Mintz, M.D.
(Administrative Medicine)
Mata K. Nikias, PH.D.
(Sociomedical Sciences)
Lloyd F. Novick, M.D.
(Health Administration)
Dhun B. Patel, PH.D.
(Environmental Health Sciences)
Harriet Presser, PH.D.
(Sociomedical Sciences)
David Rush, M.D.
(Epidemiology)
Martin Saren, M.S.
(Administrative Medicine)
Clarence Teng
(Health Administration)

ADJUNCT ASSISTANT PROFESSORS

- Suzanne Bennett-Clark, PH.D.
(Public Health Nutrition)
Roland P. Brown, PH.D.
(Tropical Medicine)
Rodolphe L. Coigney, M.D.
(Public Health Practice)
Samuel Davis, M.S.
(Administrative Medicine)
William R. Donovan, M.D.
(Public Health Practice)
John D. Frame, M.D.
(Tropical Medicine)
Jack J. Goldman, M.D.
(Public Health Practice)
Iwan D. Guichert, M.D.
(Tropical Medicine)
Vincent F. Guinee, M.D.
(Epidemiology)
Frank E. Iaquina, M.D.
(Administrative Medicine)
John C. Jeffrey, M.B.
(Tropical Medicine)
Florence Kavalier, M.D.
(Public Health Practice)
Nicetas H. Kuo, M.D.
(Public Health Practice)
Walter J. Lear, M.D.
(Public Health Practice)
Percival B. Phillips, ED.D.
(Public Health Practice)
Dorothy Roels, M.D.
(Health Administration)
Pedro Rosso, M.D.
(Inst. of Human Nutrition)
Esther A. Schisa, M.D.
(Public Health Practice)
Ralph F. Sikes, M.D.
(Epidemiology)
Robert E. Wallace, M.D.
(Public Health Practice)

ASSOCIATES

- Earland Curtis, M.D.
(Health Administration)
Michael Gochfeld, M.D.
(Occupational Medicine)
Constance Rogers
(Health Administration)

Public Health (continued)

RESEARCH ASSOCIATES

Paul N. Borzky, B.A.
(Occupational Medicine)
Corinne Kirschner, B.A.
(Sociomedical Sciences)
H. Skipton Leonard
(Environmental Sciences)
Lida Orzeck, PH.D.
(Epidemiology)
Howard Schwartz, M.D.
(Sociomedical Sciences)
Jorge Segovia, M.D.
(Sociomedical Sciences)
Anne S. Zanes, PH.D.
(Sociomedical Sciences)

INSTRUCTORS

Martin G. Blechman, M.D.
(Tropical Medicine)
Robert S. Bloom, PH.D.
(Public Health Education)
Noreen C. Clark
(Health Administration)
Marjorie A. Costa, M.D.
(Public Health Practice)
Robert E. Emann, B.B.A.
(Administrative Medicine)
Marjorie H. Frank
(Administrative Medicine)
Henry N. Fremont, M.D.
(Parasitology)
Susan Goodfriend
(Health Administration)
Alden Hammerling
(Health Administration)
Francis A. Marolla, M.A.
(Epidemiology)
Molly H. Park, M.A.
(Biostatistics)
Emil J. Pascarelli, M.A.
(Administrative Medicine)
Marcia L. Pinkett
(Health Administration)
David N. Reifsnyder, M.D.
(Tropical Medicine)
Theresa E. Russell
(Health Administration)
Livia R. Turgeon, M.S.
(Biostatistics)
Alex Tytun, B.S.
(Biostatistics)
Chung C. Wang, M.D.
(Tropical Medicine)

ASSISTANTS

Robert Galton, M.D.
(Public Health Practice)
Holger H. Hansen, M.D.
(Epidemiology)
Cherry L. Lowman, B.S.
(Public Health Nutrition)

Dulcy B. Miller, B.A.
(Administrative Medicine)
Richard H. Perry, B.A.
(Administrative Medicine)
Bruce A. Price, B.A.
(Administrative Medicine)
Athilia E. Siegman, M.S.
(Health Administration)

SENIOR STAFF ASSOCIATES

Jeanne A. Eisenberg, M.A.
(Epidemiology)
Inge F. Goldstein, M.D.
(Epidemiology)
Sheila A. Gorman
(Health Administration)

STAFF ASSOCIATES

Walter W. Curtis, PH.D.
(Health Administration)
Hillard Davis, M.D.
(Epidemiology)
Elizabeth D. McCarthy, M.A.
(Epidemiology)
Floyd W. McCormick, M.D.
(Epidemiology)
Bess I. Miller, M.P.H.
(Public Health Nutrition)
Carol R. Tarcia, M.A.
(Sociomedical Sciences)
Caron Todd, M.A.
(Sociomedical Sciences)
Geraldine A. Widner, PH.D.
(Health Administration)

LECTURERS

Kenneth Adamec, M.D.
George H. Adams, M.S.
David B. Ast, D.D.S.
Robin F. Badgley, PH.D.
George Baehr, M.D.
Gerald Bauman, PH.D.
Harold Baumgarten, Jr.
A. J. Binkert, B.A.
Howard J. Brown, M.D.
Martin Cherkasky, M.D.
George J. Christakis, M.D.
Joseph A. Cimino, M.D.
Edward D. Coates, M.D.
Jean B. Cropper, M.P.H.
Frank J. DeScipio, M.S.
Benjamin G. Dinin, M.D.
Nelson F. Evans, M.D.
Pearl R. Fisher, R.N.
Andrew C. Fleck, Jr., M.D.
Stephen L. Forstenzer, M.S.
Sylvan S. Furman, M.D.
Leo Gitman, M.D.
Natalie Goldart
Morrell Goldberg, B.A.
Harvey Gollance, M.D.
Irving Gottsegen, M.S.
Edward V. Grant
Bulah Gutenstein, M.P.H.

Jack C. Haldeman, M.D.
Virginia R. Hannon, SC.D.
David Harris, M.D.
William H. Hermann, M.S.
E. Jeffrey High, M.D.
Jacob Horowitz, M.D.
Irving T. Howorth, B.A.
John W. Kauffman
Richard N. Kerst, A.B.
Abraham M. Kleinman, M.D.
Daniel Klepak, M.D.
Schuyler G. Kohl, M.D.
John T. Kolody, M.S.
Nathan Lefkowitz, PH.D.
Joseph A. Levi, M.D.
Jacob Levine
Sol S. Lifson, M.P.H.
Milton Maloney, M.D.
Reo J. Marcotte, M.D.
Robert Markowitz, M.D.
Paul S. May, D.Sc.
Mary C. McLaughlin, M.D.
Max Milner, M.D.
Richard Nauen, M.D.
Richard J. Noonan
Daniel O'Hare, M.D.
Jean Pakter, M.D.
Marvin E. Perkins, M.D.
Ralph L. Perkins, M.S.
Joseph P. Peters, M.S.
Olive E. Pitkin, M.D.
Meyer J. Plishner, M.P.H.
Peter Rogatz, M.D.
Stephen N. Rosenberg, M.D.
Anthony J. J. Rourke, M.D.
Maurice V. Russell, ED.D.
Morris Schaeffer, M.D.
Harvey Schoenfeld, M.B.A.
Martin E. Segal
David J. Sencer, M.D.
Sam Shapiro, B.S.
Bernard M. Schiffman, M.S.
Joseph E. Snyder, M.D.
David W. Stewart, B.A.
Richard A. Stolnacke, M.S.
Vernon C. Stutzman, M.S.
Sister Margaret M. Sweeney, M.S.
Wolf Szmuncs, D.PHIL.
Leon J. Taubenhaus, M.D.
Joseph V. Terenzio, LL.B.
Eleanor B. Townsend, M.D.
Samuel Trichter, M.P.H.
Martin S. Ulan, M.S.
Edward H. Van Ness, PH.B.
Sidney B. Weinberg, M.D.
Louis Weiner, E.E.
Benjamin Werne, J.S.D.

SPECIAL LECTURERS

Leonard J. Goldwater, M.D.
W. Henry Sebrell, M.D.

At Harlem Hospital:

ADJUNCT ASSOCIATE PROFESSOR
Elliott C. Roberts, M.A.
(Administrative Medicine)

ASSISTANT PROFESSORS

- Conrad E. A. Herr, M.D.
(Administrative Medicine)
Thomas W. Jones
(Health Administration)
Noel F. Parris, M.A.
(Administrative Medicine)
James E. Wesley, M.D.
(Administrative Medicine)
Arthur C. Williams, D.D.S.
(Dental Public Health Practice)

ASSOCIATE

- Alva Jenkins, M.D.
(Administrative Medicine)

RESEARCH ASSOCIATES

- Elliott N. Camerman, M.A.
(Sociomedical Sciences)
Morton R. Siegel, M.A.
(Sociomedical Sciences)
Kathleen M. Sward, M.A.
(Administrative Medicine)

INSTRUCTOR

- Edna K. Ford, B.S.
(Administrative Medicine)

Radiology

PROFESSORS

- David H. Baker, M.D.
Walter E. Berdon, M.D.
Chu Huai Chang, M.D.
Kent Ellis, M.D.
Ruth J. Guttmann, M.D.
Eric J. Hall, M.D.
(Physics)
Sadek Hilal, M.D.
Philip M. Johnson, M.D.
Harald H. Rossi, PH.D.
(Physics)
William B. Seaman, M.D.
(Chairman)
Ernest H. Wood, M.D.

PROFESSORS OF CLINICAL RADIOLOGY

- Guy D. Potter, M.D.
Ralph G. Schlaeger, M.D.

ADJUNCT PROFESSOR

- Victor P. Bond, PH.D.

ASSOCIATE PROFESSORS

- Frieda Feldman, M.D.
William Gross, PH.D.
(Physics)
Albrecht M. Kellerer, PH.D.
(Physics)

ASSOCIATE PROFESSORS OF
CLINICAL RADIOLOGY

- Thane Asch, M.D.
Walter G. Lutz, M.D.
Patricia Tretter, M.D.
Robert L. Waldron, M.D.

ASSOCIATE CLINICAL PROFESSOR

- Meyer Alpert, M.D.

ADJUNCT ASSISTANT PROFESSOR

- Bruce J. Biavati, PH.D.
(Physics)

ASSISTANT PROFESSORS

- Arnold L. Bachman, M.D.
Carmine Borek, M.D.
William L. Campbell, M.D.
Donald L. King, M.D.
Shirley Lehnert, M.D.
(Physics)
James A. Reilly, M.D.

ASSISTANT PROFESSORS OF
CLINICAL RADIOLOGY

- David A. Follett, M.D.
Stuart L. Fuld, M.D.
Bentley A. Hollander, M.D.
Kevin L. Macken, M.D.
Bruce E. Wiley, M.D.

ASSISTANT CLINICAL PROFESSORS

- William J. Casarella, M.D.
Louis A. Rottenberg, M.D.
John J. Senyszyn, M.D.

ASSOCIATES

- Leon J. Goodman, B.S.
(Physics)
Charles M. Herbert, Jr., M.D.
Alan G. Underbrink, M.D.

RESEARCH ASSOCIATES

- William B. Bell, B.A.
(Physics)
Robert D. Colvett, M.S.
Robert F. Dvorak, M.S.
John F. Dicello, PH.D.
(Physics)
Reginald C. Rodgers, M.D.
(Physics)

INSTRUCTORS

- Claude Y. Chong, M.D.
Elpis Fountzopoulou, M.D.
Shelby Galloway, M.D.
Ira A. Horowitz, M.D.
Kenneth Jewel, M.D.
Patricia S. Kaim, M.D.
Peter Livingston, M.D.
Bruce L. McClennan, M.D.
Harry Morgan, M.D.
Edward J. Pollock, M.D.
LeRoy S. Safian, M.D.
Ruey R. Wu, PH.D.

At Mary Imogene Bassett Hospital:

- ASSISTANT CLINICAL PROFESSOR
Otto D. Sahler, M.D.

INSTRUCTOR

- Robert D. Henretig, M.D.

At Harlem Hospital:

ASSOCIATE CLINICAL PROFESSOR

- Theodore R. Stent, M.D.

ASSISTANT PROFESSOR OF
CLINICAL RADIOLOGY

- Christopher A. Johnson, M.D.

ASSISTANT CLINICAL PROFESSORS

- Jeanne Armstrong, M.D.
Peter C. Leggiadro, M.D.
Headley Scott, M.D.

ASSOCIATE

- Laurencia B. Regalado, M.D.

INSTRUCTOR

- Paula W. Brill, M.D.

At Roosevelt Hospital:

ASSOCIATE CLINICAL PROFESSOR

- Albert A. Dunn, M.D.

ASSISTANT CLINICAL PROFESSORS

- John de L. Morris, M.D.
George Stassa, M.D.
Harold Stitt, M.D.

At St. Luke's Hospital:

PROFESSOR OF CLINICAL RADIOLOGY

- Nathaniel Finby, M.D.

ASSOCIATE PROFESSOR OF
CLINICAL RADIOLOGY

- Richard D. Kittridge, M.D.

ASSOCIATE CLINICAL PROFESSORS

- Kuo-York Chynn, M.D.
Virginia Kanick, M.D.

ASSISTANT PROFESSOR OF
CLINICAL RADIOLOGY

- John T. Hsu, M.D.

INSTRUCTORS

- Ina A. Altman, M.D.
Jeanne W. Baer, M.D.
Hugh C. Davidson, M.D.
Mary Ann Radkowski, M.D.
William I. Shaw, M.D.

ASSISTANT CLINICAL PROFESSORS

- Leonard M. Liegner, M.D.
Vincent Valensi, M.D.

Rehabilitation Medicine

PROFESSORS

- Robert C. Darling, M.D.
(Baruch Professor and
Chairman)
John A. Downey, M.D.
Charles A. Huckaba, PH.D.

CLINICAL PROFESSOR

- Morton Hoberman, M.D.

Rehabilitation Medicine*(continued)*

ASSISTANT PROFESSOR

Stanley J. Myers, M.D.

ASSISTANT CLINICAL PROFESSORS

Antonio Cocchiarella, M.D.

Nathan Kaplan, M.D.

ASSOCIATES

Marjorie Kellogg, M.S.

Naomi L. Turner, M.S.

RESEARCH ASSOCIATE

Wallace W-K. Luke, B.A.

ASSISTANT

Vivienne Katz, M.A.

SPECIAL LECTURER

A. David Gurewitsch, M.D.

At Blythedale Children's Hospital:

INSTRUCTOR

Robert Stone, M.D.

At Harlem Hospital:

CLINICAL PROFESSOR

Albert D. Anderson, M.D.

ASSOCIATE CLINICAL PROFESSOR

Herbert L. Thornhill, M.D.

ASSISTANT CLINICAL PROFESSORS

Roy H. Brown, M.D.

Yasoma B. Challenor, M.D.

Lucille C. Gunning, M.D.

(Pediatrics)

Claire Schiller, M.B.

ASSOCIATE

Horace W. Cosla, M.D.

INSTRUCTORS

Cecelia A. Macauley, M.A.

Joseph A. Molloy, M.A.

At New York State Rehabilitation Hospital:

ASSOCIATE CLINICAL PROFESSOR

Luke S. W. Chu, M.D.

ASSOCIATE

Rodolfo L. Reyes, M.D.

INSTRUCTOR

Ludmilla S. Finkelstein, M.D.

ASSISTANT

Cayetano C. Co, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSOR

John J. Untereker, M.D.

ASSISTANT

Raul P. Sala, M.D.

At St. Luke's Hospital:

ASSOCIATE CLINICAL PROFESSOR

Shyh-Jong Yue, M.D.

ASSISTANT CLINICAL PROFESSOR

Lucille Tsu Pai, M.D.

Occupational Therapy

ASSOCIATE PROFESSOR

Marie-Louise Franciscus, M.A.

ASSISTANT PROFESSOR

Adelaide A. Deutsch, M.A.

ASSISTANT CLINICAL PROFESSOR

Karen F. B. Diasio, M.A.

ADJUNCT ASSISTANT PROFESSOR

Janet C. Vandiveer, B.S.

ASSOCIATES

Gail S. Fidler, B.A.

Stephanie Presseller, B.A.

INSTRUCTORS

Nedra P. Gillette, B.S.

Barbara E. Neuhaus, B.S.

Eleanor V. Shelly, B.S.

Alice R. Trei, B.S.

Physical Therapy

ASSOCIATE PROFESSOR

Mary E. Callahan, M.A.

ASSISTANT PROFESSORS

Ruth Dickinson, M.A.

Althea M. Jones, B.S.

ASSOCIATE

Bernadette Hecox, B.S.

INSTRUCTORS

Theodore Corbitt, M.A.

Judith R. Hogan, B.S.

Margaret A. O'Neill, M.A.

Surgery

PROFESSORS

Charles L. Fox, M.D.

(from Microbiology)

David V. Habif, M.D.

(Milstein Professor)

Frederic P. Herter, M.D.

(Auchincloss Professor)

Robert B. Hiatt, M.D.

John M. Kinney, M.D.

Nathan Lane, M.D.

(Surgical Pathology)

Raffaele Lattes, M.D.

(Surgical Pathology)

Keith Reemtsma, M.D.

(Chairman)

Thomas V. Santulli, M.D.

PROFESSORS OF CLINICAL SURGERY

Harold G. Barker, M.D.

George F. Crikelair, M.D.

James R. Malm, M.D.

Ferdinand F. McAllister, M.D.

Milton R. Porter, M.D.

Arthur B. Voorhees, M.D.

ASSOCIATE PROFESSORS

Frank E. Gump, M.D.

Gordon I. Kaye, Ph.D.

(Surgical Pathology)

John B. Price, Jr., M.D.

Marianne Wolff, M.D.

(Surgical Pathology)

ASSOCIATE PROFESSORS OF CLINICAL SURGERY

Frederick O. Bowman, Jr., M.D.

Joseph A. Buda, M.D.

Carl R. Feind, M.D.

Alfred M. Markowitz, M.D.

John F. Prudden, M.D.

Grant Sanger, M.D.

Francis C. Symonds, Jr., M.D.

ASSOCIATE CLINICAL PROFESSORS

Hugh Auchincloss, Jr., M.D.

Bard Cosman, M.D.

Charles W. Findlay, M.D.

Edmund N. Goodman, M.D.

Alfred Jaretzki, III, M.D.

David M. C. Ju, M.D.

Herbert C. Maier, M.D.

Edward B. Self, M.D.

Philip D. Wiedel, M.D.

ASSISTANT PROFESSORS

Paul M. Beach, Jr., M.D.

Harold M. Bruck, M.D.

Richard N. Edie, M.D.

Kenneth Forde, M.D.

Irving Goodman, Ph.D.

(from Biochemistry)

Richard Weil, III, M.D.

Bashir A. Zikria, M.D.

ASSISTANT PROFESSORS OF CLINICAL SURGERY

Robert G. Bertsch, M.D.

Shivaji B. Bhonslay, M.D.

Sven Kister, M.D.

John N. Schullinger, M.D.

ASSISTANT CLINICAL PROFESSOR

Paul H. Gerst, M.D.

RESEARCH ASSOCIATES

Sidney J. Bennett, M.D.

John R. Broell, M.D.

Joel Kupersmith, Ph.D.

(from Pharmacology)

Magda Levy, Sc. Nac.

Calvin Long, Ph.D.

Duncan L. McCollester, M.D.

Charles Merker, M.D.

Shanta M. Modak, M.D.

RESEARCH ASSOCIATES (*continued*)

Masumi Nozawa, M.D.
 Alan Saroff
 (from Pharmacology)
 Nicole Suci-Foch, M.D.
 Anthony D. Whittemore, M.D.

INSTRUCTORS

Alfred Azzoni, M.D.
 Elliott M. Badder, M.D.
 Sherman M. Bull, M.D.
 Robert Hands, M.D.
 Marvin L. Hartstein, M.D.
 Donald L. Heimlich, M.D.
 Kenneth C. Morley, Jr., M.D.
 Robert J. Mulcare, M.D.
 Charles A. Slanetz, M.D.
 Phillip W. Thieman, M.D.
 James S. Todd, M.D.

ASSISTANTS

John Y. M. Relland, M.D.
 Thomas E. Shaw, M.D.

SPECIAL LECTURER

William A. Gardner, M.D.

At Mary Imogene Bassett Hospital:

CLINICAL PROFESSOR

David A. Blumenstock, M.D.

ASSOCIATE CLINICAL PROFESSOR

Rodman D. Carter, M.D.
 (Urology)

ASSISTANT CLINICAL PROFESSORS

Thomas P. Ashford, M.D.
 Edward J. Carey, Jr., M.D.
 Thomas A. Farrell, M.D.
 (Ophthalmology)
 Martien A. Mulder, M.D.
 John E. Olsen, M.D.

At Harlem Hospital:

PROFESSOR

Jose M. Ferrer, M.D.

ASSOCIATE PROFESSOR OF CLINICAL SURGERY

Frederick R. Randall, M.D.

ASSOCIATE CLINICAL PROFESSORS

John E. Hutchinson, M.D.
 Robert F. Morton, M.D.

ASSISTANT CLINICAL PROFESSORS

Salvatore G. Cinque, M.D.
 Arthur L. Garnes, M.D.
 Walter W. Miner, M.D.
 John W. Parker, Jr., M.D.
 Eugene Quash, M.D.
 Joseph A. Tamerin, M.D.
 John M. Wilson, M.D.

ASSOCIATES

Lowyd W. R. Ballantyne, Jr., M.D.
 Matthew D. Branche, M.D.

E. Foster Conklin, M.D.
 Seldin J. Dickinson, M.D.
 Harold P. Freeman, M.D.
 Malcolm Moley, M.D.
 Ronald N. Ollstein, M.D.
 Vincent Porter, M.D.
 Lawrence E. Taylor, M.D.
 Irving J. Thorne, M.D.
 Pierre G. Von Bockstaele, M.D.

INSTRUCTORS

Vincent W. Ansanelli, M.D.
 Richard W. Brenner, M.D.
 Eustace E. S. Corbin, M.D.
 Egel Francois, M.D.
 Edoardo Giuliani, M.D.
 George K. Henry, M.D.
 Autar S. Josen, M.D.
 Barnett M. Miller, M.D.
 Haroutune Mekhjian, M.D.
 Max Yergan, Jr., M.D.

At Roosevelt Hospital:

CLINICAL PROFESSOR

Walter Wichern, M.D.

ASSOCIATE CLINICAL PROFESSORS

William H. Cassebaum, M.D.
 Joseph Ford, M.D.
 Adrian Lambert, M.D.
 J. William Littler, M.D.
 James B. Rodgers, M.D.
 Thomas S. Royster, M.D.

ASSISTANT CLINICAL PROFESSORS

John T. Brennan, Jr., M.D.
 David M. Carberry, M.D.
 Richard G. Eaton, M.D.
 Paul D. Harris, M.D.
 Charles C. Harrold, Jr., M.D.
 James A. MacDonald, M.D.
 Cedric J. Priebe, M.D.
 James H. Terry, Jr., M.D.
 T. Scudder Winslow, M.D.
 Chin Bor Yeoh, M.D.

INSTRUCTORS

H. Clay Alexander, M.D.
 Thomas H. Dailey, M.D.
 Clarence A. Dunn, Jr., M.D.
 William V. Healey, Jr., M.D.

At St. Luke's Hospital:

PROFESSOR

Lawrence E. Stevens, M.D.

PROFESSOR OF CLINICAL SURGERY

Hugh F. Fitzpatrick M.D.

CLINICAL PROFESSOR

John P. West, M.D.

ASSOCIATE CLINICAL PROFESSORS

W. Graham Knox, M.D.
 Colin W. McCord, M.D.
 Richard B. Stark, M.D.

ASSISTANT CLINICAL PROFESSORS

Robert T. Edmunds, M.D.
 Robert W. Fraser, M.D.
 Robert E. McCabe, M.D.
 Carl S. Oakman, M.D.
 Robert W. Schick, M.D.
 Edward G. Stanley-Brown, M.D.

INSTRUCTORS

Charles R. Blair, M.D.
 Peter A. Bossart, M.D.
 Clayton R. DeHaan, M.D.
 Conrad Lattes, M.D.
 Robert E. Miller, M.D.
 Alfred A. Moscarella, M.D.
 Howard Nay, M.D.
 John J. White, M.D.

ASSISTANTS

Leif O. Holgersen, M.D.
 Lawrence F. Simon, M.D.

Urology

PROFESSOR

John K. Lattimer, M.D.
 (Chairman)

PROFESSOR OF CLINICAL UROLOGY

Ralph J. Veenema, M.D.

ASSOCIATE PROFESSOR

Myron Tannenbaum, M.D.
 (from Pathology)

ASSOCIATE PROFESSOR

OF CLINICAL UROLOGY

Hans H. Zinsser, M.D.

ASSOCIATE CLINICAL PROFESSORS

Stanley B. Braham, M.D.
 Myron S. Roberts, M.D.

ASSISTANT PROFESSORS

Harry Seneca, M.D.
 Arthur M. Smith, M.D.
 Philip Tomashefsky, PH.D.
 (from Pathology)

ASSISTANT PROFESSORS

OF CLINICAL UROLOGY

Peter J. Puchner, M.D.
 Nicholas A. Romas, M.D.
 Aurelio C. Uson, M.D.

ASSISTANT CLINICAL PROFESSORS

J. Timothy Donovan, M.D.
 Louis J. Dougherty, M.D.
 John P. Grant, M.D.
 Michael W. Justice, M.D.
 Frank W. Longo, M.D.
 Perrin B. Snyder, M.D.
 Sandor H. Wax, M.D.

ASSOCIATES

Peter N. DeSanctis, M.D.
 Charles E. Umhey, Jr., M.D.
 Ralph C. Yeaw, M.D.

Urology (continued)

RESEARCH ASSOCIATE

Stanford Pulrang, M.D.

INSTRUCTORS

Frederick S. Dick, M.D.
 Clement A. Furey, Jr., M.D.
 Robert Granato, M.D.
 Philip B. Jensen, M.D.
 Paul Tucci, M.D.
 Robert R. White, III, M.D.
 Arthur T. Willetts, M.D.

ASSISTANTS

Luis M. Abren, M.D.
 Stanley Bloom, M.D.
 Richard Fadil, M.D.
 Stanley J. Landau, M.D.

SPECIAL LECTURERS

Bruno Fingerhut, M.D.
 Meyer M. Melicow, M.D.

At Mary Imogene Bassett Hospital:

ASSOCIATE CLINICAL PROFESSOR

Rodman D. Carter, M.D.
 (from Surgery)

At Harlem Hospital:

ASSISTANT CLINICAL PROFESSOR

Harold A. Garnes, M.D.

INSTRUCTOR

Urbana K. Guarin, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSORS

William J. Nelson, M.D.
 Robert D. Wickham, M.D.

INSTRUCTOR

James W. Vastola, M.D.

At St. Luke's Hospital:

ASSISTANT PROFESSOR OF
CLINICAL UROLOGY

Manuel Fernandes M.D.

ASSISTANT CLINICAL PROFESSOR

Joseph N. Ward, M.D.

INSTRUCTORS

Alfred F. Fretz, M.D.
 Walced G. Maloof, M.D.
 Joseph D. Putignano, M.D.
 Constantine Photos, M.D.
 Rudolph D. Talarico, M.D.
 Pellegrino J. Tozzo, M.D.

ASSISTANT

Arambi P. Subramaniam

**International Institute for the
Study of Human Reproduction**

DIRECTOR

Raymond L. Vande Wiele, M.D.

PROFESSORS

Georgiana Jagiello, M.D.
 (Obstetrics and Gynecology and
 Human Genetics and
 Development)
 Seymour Lieberman, PH.D.
 (Biochemistry)
 Robert S. Neuwirth, M.D.
 (Obstetrics and Gynecology)
 Ralph M. Richart, M.D.
 (Obstetrics and Gynecology
 and Pathology)
 Raymond L. Vande Wiele, M.D.
 (Obstetrics and Gynecology)

ASSOCIATE PROFESSORS

Elizabeth Connell, M.D.
 (Obstetrics and Gynecology)
 Robert Lewis, PH.D.
 (Geography)

SENIOR RESEARCH ASSOCIATE

Moni Nag, PH.D.

ASSOCIATE CLINICAL PROFESSOR

John O'Connor, M.D.
 (Psychiatry)

ASSISTANT PROFESSORS

Peter Carmel, M.D.
 (Neurological Surgery)
 Michel Ferin, M.D.
 (Physiology)
 Linbania Jacobson, ED.D.
 (Nursing)
 Raphael Jcwelewicz, M.D.
 (Obstetrics and Gynecology)
 Harriet Presser, PH.D.
 (Public Health)
 Earl Zimmerman, M.D.
 (Neurology)

ASSISTANT CLINICAL PROFESSOR

Anne Picrson, M.D.
 (Obstetrics and Gynecology)

RESEARCH ASSOCIATES

Rachel Aubrey, M.S.W.
 Milagros Benedicto, M.D.
 Gilles Bleau, M.D.
 Ernesto Bosch, M.D.
 Kwan-Hwa Chen, M.A.
 Belle Granich, PH.D.
 Donald Helbig, M.D.
 Mario Jaramillo-Gomcz, M.D.
 Usha M. Joshi, PH.D.
 Burton Lerner, M.D.
 Juan B. Londono, M.S.
 Josc Oliva, M.S.

Bernard G. Pasquariella, M.A.
 Ralph X. Reynolds, PH.D.
 Susan Scrimshaw, M.A.
 Julia Shimmel, M.A.
 Lenore O. Stern, M.A.
 Prem Talwar, PH.D.

STAFF ASSOCIATES

Victor Estrada, M.S.W.
 Susan Van der Vynckt, M.S.

INSTRUCTORS

Harold I. Calvin, PH.D.
 (Human Genetics and
 Development)
 Richard C. Friedman, M.D.
 (Psychiatry)

Institute of Cancer Research

PROFESSORS

Philip Feigelson, PH.D.
 (Biochemistry)
 Elliott F. Osseman, M.D.
 (Medicine)
 Sol Spiegelman, PH.D.
 (Human Genetics and
 Development)
 (Director of Institute)

ASSOCIATE PROFESSORS

Dezider Grunberger, PH.D.
 (Biochemistry)
 I. Bernard Weinstein, M.D.
 (Medicine)

ASSISTANT PROFESSORS

Mehdi Farhangi, M.D.
 (Medicine)
 Daniel Kacian, PH.D.
 (Human Genetics and
 Development)
 Donald R. Mills, PH.D.
 (Human Genetics and
 Development)
 Jeffrey Schlom, PH.D.
 (Human Genetics and
 Development)

RESEARCH ASSOCIATES

Matteo C. Adinolfi, M.D., PH.D.
 William Cuatico, M.D.
 Ann Henderson, PH.D.
 Takashi Isobe, M.D.
 Barbara Jones, B.A.
 L. G. Matthias Klockars, II, M.D.
 Tamar Landau, PH.D.
 Tohru Nishihara, PH.D.
 Peter S. Pulkrabek, PH.D.
 Gunther A. Schutz, M.D.
 Leos G. Veprak, M.D., PH.D.
 Nobuo Yamaguchi, M.D.
 Auraham Yaniv, PH.D.
 Fu-Li Yu, PH.D.

INSTRUCTORS

Rudiger Hehlmann, M.D.
(Human Genetics and
Development)
Fred R. Kramer, PH.D.
(Human Genetics and
Development)
Donald Kufe, M.D.
(Human Genetics and
Development)

Institute of Human Nutrition

DIRECTOR

Myron Winick, M.D.

PROFESSORS

John W. Fertig, PH.D.
(Biostatistics)
DeWitt S. Goodman, M.D.
(Medicine)
Michael Katz, M.D.
(Tropical Medicine)
Hollis R. Lynch, PH.D.
(History)
Mary B. McCann, M.D.
(Nutrition, Teachers College)

Mervin Susser, M.D.
(Epidemiology)
Theodore B. Van Itallie, M.D.
(Medicine)
Myron Winick, M.D.
(Pediatrics)
Robert Winters, M.D.
(Pediatrics)

ADJUNCT PROFESSOR

Myron Brin, PH.D.
(Public Health Nutrition)

ASSOCIATE PROFESSORS

Jo Anne Brasel, M.D.
(Pediatrics)
Elinor F. Downs, M.D.
(Public Health Practice)
Sami A. Hashim, M.D.
(Public Health Nutrition)
Rawle McIntosh, M.D.
(Pediatrics)
Richard S. Rivlin, M.D.
(Medicine)

ASSISTANT PROFESSORS

Robert S. Bernstein, M.D.
(Medicine)

Ruth C. Harris, M.D.
(Pediatrics)
F. Xavier Pi-Sunyer, M.D.
(Medicine)
David Rush, M.D.
(Epidemiology)

ASSISTANT CLINICAL PROFESSOR

Thomas W. Patrick, Jr., M.D.
(Pediatrics)

ADJUNCT ASSISTANT PROFESSORS

Suzanne Bennett-Clark, PH.D.
(Public Health Nutrition)
Pedro Rosso, M.D.
(Public Health Nutrition)

ASSISTANT

Cherry Lowman, B.S.
(Public Health Nutrition)

RESEARCH ASSOCIATE

Bess I. Miller, M.P.H.
(Public Health Nutrition)

SPECIAL LECTURER

W. Henry Sebrell, Jr., M.D.
(Public Health Nutrition)

Academic Staff

School of Dental and Oral Surgery
Columbia University in the City of New York

Academic Staff

School of Dental and Oral Surgery

Columbia University in the City of New York

Emeritus Officers

Houghton H. Holliday.....*Stomatology*
Carl R. Oman.....*Restorative Dentistry*

Gilbert P. Smith.....*Restorative Dentistry*
(and *Dean Emeritus*)
Frances A. Stoll.....*Dental Hygiene*

Community Health

ASSOCIATE PROFESSOR

Harold L. Applewhite, D.D.S., M.P.H.

ADJUNCT PROFESSOR

David A. Soricelli, D.D.S., M.P.H.

ASSISTANT CLINICAL PROFESSOR

Maurice S. Phillips, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Paul J. Dedaux, D.D.S.

Neal Alan Demby, D.M.D.

Carlton A. Sparks, D.D.S., M.P.H.

Barry M. Weinberg, D.D.S.

ADJUNCT ASSISTANT PROFESSOR

William Steibel, D.D.S.

LECTURERS

Frank R. Hopf, D.D.S., M.P.H.

Hilton O. Hosannah, D.D.S., M.P.H.

Herbert Williams, M.S.

SPECIAL LECTURER

Sydney C. Rappaport, D.D.S.

ASSISTANT CLINICAL PROFESSOR

I. Joel Leeb, D.D.S., M.S.D., PH.D.

ADJUNCT PROFESSOR

Fred Rothenberg, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Gerald H. Besen, D.D.S.

Howard I. Blum, D.D.S.

Murray A. Cantor, D.D.S.

Marvin M. Ferdman, D.D.S.

Frederic E. Goodman, D.D.S.

Edward Greenfield, D.D.S.

William Miller, D.D.S.

Norbert Ripp, D.D.S.

Charles S. Solomon, D.D.S.

Howard B. Vogel, D.D.S.

INSTRUCTORS

Robert L. Ambinder, D.D.S.

Philip J. Bauer, D.M.D.

Stuart A. Berman, D.D.S.

Harmon R. Katz, D.D.S.

Lewis Zagon, D.D.S.

Education and Behavioral Science

ASSOCIATE PROFESSOR

Samuel F. Dworkin, D.D.S., PH.D.

ASSISTANT PROFESSOR

Allan N. Blitz, ED.D.

Dental Auxiliary Utilization

ASSOCIATE PROFESSOR

David Kaplan, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Joseph E. Kafer, D.M.D.

ADJUNCT ASSISTANT PROFESSORS

Robert L. Jacobson, D.D.S.

Martin Handlers, D.D.S.

INSTRUCTORS

S. Gerald Cardinale, D.D.S.

Edgar Gattegno, D.D.S.

James J. Johnson, D.D.S.

Eugene M. Levine, D.M.D.

Irwin Mindell, D.D.S.

Dental Hygiene

ASSOCIATE PROFESSOR

Patricia A. McLean, M.A., R.D.H.

ASSISTANT PROFESSORS

Marlene Klyvert, B.S., R.D.H.

Dona E. W. McKinney, B.S., R.D.H.

INSTRUCTORS

Gunda M. Brakas, M.S., R.D.H.

Michele Darby, B.S., R.D.H.

Charlotte Hangorsky, B.S., R.D.H.

Endodontics

CLINICAL PROFESSORS

Joseph M. Leavitt, D.D.S.

Irving J. Naidorf, D.D.S.

ASSOCIATE CLINICAL PROFESSORS

S. Abel Moreinis, D.D.S.

Thomas W. Portway, D.D.S.

Interdisciplinary Correlations

ASSOCIATE PROFESSOR

Hyman D. Koch, D.D.S.

ASSISTANT PROFESSOR

Harold M. Eiser, D.D.S., M.P.H.

Operative Dentistry

PROFESSOR

Edward A. Cain, Jr., D.D.S.

ASSOCIATE CLINICAL PROFESSORS

Stanislaw H. Brzustowicz, D.D.S.

Thomas W. Portway, D.D.S.

Steven S. Scrivani, D.D.S.

ASSISTANT CLINICAL PROFESSORS

Roy Boelstler, D.D.S.

Frank W. Pandolfo, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Kenneth C. Deesen, D.D.S.

William H. Silverstein, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Paul R. Bjorklund, D.D.S.

Pandelis Camesas, D.D.S.

Herbert P. Fritz, D.D.S.

Frank L. Mellana, D.D.S.

Joseph A. Pianpiano, D.D.S.

George Rudensky, D.D.S.

INSTRUCTORS

Alvin T. Boyd

Richard A. Greenberg, D.D.S.

Walter A. Gutstein, D.D.S.

Charles A. Rogers, D.D.S.

LECTURERS

James W. Benfield, D.D.S.

George F. Lindig, D.D.S.

George V. Lyons, D.D.S.

Oral Biology

ASSOCIATE PROFESSOR

David J. Smith, D.D.S.

ASSISTANT PROFESSORS

Letty Moss-Salentijn, D.D.S.
(Anatomy)
Spyros Vratsanos, PH.D.

ASSISTANT CLINICAL PROFESSOR

Herbert P. Ostreicher, D.D.S.

ADJUNCT ASSISTANT PROFESSOR

Abraham Greenberg, D.D.S.

SPECIAL LECTURER

Edmund Applebaum, D.D.S.
(Anatomy)

ASSOCIATES

Henry P. Levy, D.D.S.
Philip Person, D.D.S., PH.D.

Oral Surgery

ADJUNCT PROFESSORS

Harold D. Baumash, D.D.S.
Louis J. Loscalzo, D.D.S.
Louis Mandel, D.D.S.
George A. Minervini, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Julien W. Anderson, D.D.S.
Reynold J. Baumstark, D.D.S.
Kourken A. Daglian, D.D.S.
Bertram Klatskin, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Anthony L. DiMango, D.D.S.
John Esposito, Jr., D.D.S.
Robert L. Haas, D.D.S.
Ian Hu, D.D.S.
Morton Netupsky, D.M.D.
Daniel D. Schube, D.D.S.
Boaz M. Shattan, D.D.S.
Morton J. Stern, D.D.S.

INSTRUCTOR

Herbert Rabinowitz, D.D.S.

ASSISTANT

Quentin M. Murphy, D.D.S.

At the Roosevelt Hospital:

PROFESSOR

Andrew M. Linz, D.D.S., M.SC.

ADJUNCT PROFESSOR

Peter B. Terenzio, L.L.B., M.H.A.

At St. Luke's Hospital:

PROFESSOR

Edward Stroh, D.D.S.

Orofacial Development

PROFESSOR

Sidney L. Horowitz, D.D.S.

ASSOCIATE CLINICAL PROFESSOR

Henry R. Junemann, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Alice J. Chabora, PH.D.

ADJUNCT ASSISTANT PROFESSORS

Gary L. Lighter, D.M.D.
Edward C. McNulty, D.M.D.

INSTRUCTORS

Erlinda A. Benedicto, D.M.D.
Arnold I. Fink, D.D.S.

RESEARCH ASSOCIATE

Heli Vinkka, D.D.S.

Orthodontics

PROFESSOR

Nicholas A. Di Salvo, D.D.S., PH.D.

ASSOCIATE PROFESSOR

Henry I. Nahoum, D.D.S.

ASSISTANT PROFESSOR

James B. Horn, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Lawrence W. Bergmann, D.D.S.

ADJUNCT PROFESSOR

Clifford LeR. Whitman, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Monroe M. Gliedman, D.D.S.
Richard Gliedman, D.D.S.
Jacob I. Kaplan, D.D.S.
Eugene F. Murphy, D.D.S.
Armand M. Oppenheimer, D.D.S.
Julius Tarshis, D.D.S.
Russell J. Vanacek, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Howard S. Anstendig, D.M.D.
Abraham M. Blechman, D.D.S.
Natale J. Giordano, D.D.S.
Robert J. Huettner, D.D.S.
Robert Isaacson, D.D.S.
Gustave Lasoff, D.D.S.
Malcolm E. Meistrell, Jr., D.D.S.
Thomas E. Sheehy, D.D.S.

LECTURERS

Robrt M. Cole, D.D.S.
Harry A. Galton, D.D.S.
Stanley L. Gibbs, D.D.S.
Howard J. Ruderman, D.D.S.

RESEARCH ASSOCIATES

Solomon L. Katz, D.D.S.
Irwin Steuer, D.D.S.

Pedodontics

PROFESSOR

Solomon N. Rosenstein, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Frederick Berlin, D.D.S.

ADJUNCT ASSISTANT PROFESSOR

Arnold Rosenberg, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Albert Green, D.D.S.
Marvin B. King, D.D.S.
George Kiriakopoulos, D.D.S.
Seymour Koster, D.D.S.
Philip Kutner, D.D.S.
Alfred J. Mezza, D.D.S.
Julian Schroff, D.D.S.
William A. Verlin, D.D.S.
David H. Wolmer, D.D.S.

INSTRUCTOR

Robert Averno, D.D.S.

LECTURERS

Jerry J. Adelson, D.D.S.
Robert L. Fisher, D.D.S.

Periodontics

PROFESSOR

Robert Gottsegen, D.D.S.

ASSOCIATE CLINICAL PROFESSORS

Wesley Halpert, D.D.S.
Murray Schwartz, D.D.S.

ASSISTANT CLINICAL PROFESSORS

Robert L. Blair, D.D.S.
Raymond Z. Darakjian, D.D.S.
Milton Klempert, D.D.S.
Burton Langer, D.M.D., M.SC.D.

ADJUNCT PROFESSORS

Frank E. Beube, L.D.S., D.D.S.
Leonard S. Hirschfeld, D.D.S.
Melvin L. Morris, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Bernard S. Moskow, D.D.S., M.SC.D.
Bernard H. Wasserman, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Vincent J. Abbatiello, D.M.D.
Michael Baron, D.D.S.
Robert D. Blank, D.M.D.
Herman Cantor, D.D.S.
Alvin D. Cederbaum, D.M.D.
P. Charles Gabriele, D.D.S.
Arnold M. Geiger, D.D.S.
Jack Goetz, D.D.S.
Stephen F. Goodman, D.D.S.
Raymond F. Johnson, Jr., D.D.S.
Irving A. Karel, D.D.S.
Walter I. Lipow, D.D.S.
Alan Lubarr, D.M.D.
David M. Monahan, D.D.S.
Ronald B. Odrich, D.D.S.
Morton C. Rennert, D.D.S.
Marvin V. Rubin, D.D.S.
Albert Salkind, D.D.S.
Michael B. Savin, D.M.D.
Marvin Solomon, D.D.S.
Marvin Spodek, D.D.S.
Stephen D. Stein, D.D.S.

Preventive Dentistry

PROFESSOR

Irwin D. Mandel, D.D.S.

ASSOCIATE PROFESSORS

Samuel F. Dworkin, D.D.S., PH.D.

Stephen Wotman, D.D.S.

(Special Assistant to the Dean)

ASSISTANT PROFESSORS

Daniel H. Fine, D.M.D.

Albert N. Zengo, D.D.S.

ADJUNCT PROFESSOR

Neal W. Chilton, D.D.S., M.P.H.

ADJUNCT ASSOCIATE PROFESSOR

Herbert I. Oshrain, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Robert S. Goldman, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Lillian H. Bachman, D.D.S.

Harold P. Cobin, D.D.S.

Milton Potters, D.D.S.

Kenneth L. Siegel, D.D.S.

INSTRUCTORS

David C. Abelson, D.D.S.

Robert S. Breakstone, D.D.S.

Stephen R. Katz, D.D.S.

Stephen Mender, D.M.D.

LECTURERS

Marvin Mansky, D.D.S.

Arthur B. Weiss, D.D.S.

ASSISTANT

Howard Gordon, D.D.S.

RESEARCH ASSOCIATE

Ephraim Weinstein, D.D.S.

Prosthodontics

PROFESSOR

John J. Lucca, D.D.S.

ASSOCIATE PROFESSORS

Herbert D. Ayers, D.D.S.

Victor S. Caronia, D.D.S.

Ennio L. Uccellani, D.D.S.

ASSOCIATE CLINICAL PROFESSORS

Alvin J. Grayson, D.D.S.

Maxwell Widrow, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Jacob Abelson, D.D.S.

ADJUNCT PROFESSORS

Sebastian A. Bruno, D.M.D.

Robert E. Herlands, D.D.S.

George W. Hindels, M.D., D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Joseph A. De Julia, D.D.S.

Max P. Fishberg, D.D.S.

Joel Friedman, D.D.S.

William J. Miller, D.D.S.

John M. Scarola, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Harold H. Blank, D.D.S.

Gustav T. Durrer, D.D.S.

Gerald M. Galvin, D.D.S.

Joel Goldin, D.M.D.

Alfred Holzman, D.D.S.

Arnold S. Jutkowitz, D.M.D.

Robert D. Miner, D.D.S.

Ralph K. Neuhaus, D.D.S.

William Raebeck, Jr., D.D.S.

Robert Renner, D.D.S.

Louis I. Rubins, D.D.S.

Peter H. Strife, II, D.D.S.

INSTRUCTORS

James P. McCosker, D.D.S.

Dennis N. Morea, D.D.S.

Nicholas A. Vero

LECTURER

Morris Eckhaus, D.D.S.

**Psychiatric Institute
Dental Service**

ASSOCIATE PROFESSOR

Austin H. Kutscher, D.D.S.

ASSOCIATE CLINICAL PROFESSOR

Arthur Shain, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Joseph C. DeLisi, D.D.S.

Ellen N. Hosiosky, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

William C. Baral, D.D.S.

Martin Bassiur, D.D.S.

Gary D. Gross, D.D.S.

Bernard Gurian, D.D.S.

Herman S. Harris, D.D.S.

Harold P. Rose, D.M.D.

Ann Turkel, M.D.

Jay Weiss, D.M.D.

Stomatology

PROFESSORS

Joseph A. Cuttita, D.D.S.

Edward V. Zegarelli, D.D.S.

(Robinson Professor)

ASSISTANT PROFESSOR

David J. Zegarelli, D.D.S.

ADJUNCT PROFESSORS

Jack Budowsky, D.D.S.

Joseph J. Marbach, D.D.S.

ASSOCIATE CLINICAL PROFESSOR

Michael Z. Marder, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Morton S. Brod, D.D.S.

Robert E. Crowley, D.D.S.

Mortimer Karmioli, D.D.S.

Eugene P. LaSota, D.D.S.

John K. Lind, D.D.S.

Robert Umans, D.D.S.

Robert F. Walsh, D.D.S.

David Zeisler, D.D.S.

ASSISTANT CLINICAL PROFESSORS

John V. Donovan, D.D.S.

Laurence J. Levine, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Martin I. Ames, D.D.S.

Jerome Bartwink, D.M.D.

Martin J. Fields, D.M.D.

Frances R. Karlan, D.D.S.

Paul Kornfeld, D.D.S.

Joseph Luban, D.D.S.

Philip J. Santora, Jr., D.M.D.

Robert N. Schiff, D.D.S.

Diane Stern, D.D.S.

Edward Zerden, D.D.S.

INSTRUCTORS

James J. Cancro, D.D.S.

John F. Capriccio, D.D.S.

Fred Danziger, D.D.S.

Harold Darwin, D.D.S.

Steven I. Gold, D.D.S.

John J. Mongiardo, D.D.S.

Thomas F. Morgenstern, D.M.D.

Philip Terman, D.D.S.

RESEARCH ASSOCIATE

Herbert F. Silvers, D.D.S.

Appendix

EXHIBIT A

THE PRESBYTERIAN HOSPITAL

Balance

DECEMBER

ASSETS

	<i>December 31</i>	
	<i>1972</i>	<i>1971</i>
CURRENT FUNDS ASSETS:		
Cash	\$ 4,127,928	\$ 2,479,277
Investments — bonds, etc. — at cost or contributed value (which approximates quoted market value in 1972 and 1971)	1,029,417	1,185,963
Accounts receivable (less reserve — 1972, \$1,160,868; 1971, \$736,334)	14,857,359	11,002,695
Supplies and materials — at cost	1,929,294	1,647,065
Interest accrued and dividends receivable	893,211	976,307
Prepaid expenses	157,481	168,652
TOTAL CURRENT FUNDS ASSETS	22,994,690	17,459,959
ENDOWMENT AND PLANT FUNDS ASSETS:		
Cash	273,038	2,699,723
Investments:		
Bonds and stocks — at cost or contributed value (quoted market value — 1972, \$140,069,949; 1971, \$127,023,229) ..	99,816,770	98,627,767
Real estate — at cost less depreciation	7,202,325	7,407,601
Loan to building funds from unrestricted endowment funds ..	6,000,000	
Other	247,982	338,932
Property and equipment — at cost (less accumulated depreciation — 1972, \$36,531,292; 1971, \$33,020,536)	76,082,973	70,709,031
TOTAL	\$212,617,778	\$197,243,013

See accompanying statement of significant accounting policies.

THE CITY OF NEW YORK

EXHIBIT A

et

AND 1971

FUNDS AND LIABILITIES

	<i>December 31</i>	
	<i>1972</i>	<i>1971</i>
CURRENT FUNDS AND LIABILITIES:		
Accounts payable	\$ 5,277,580	\$ 4,990,844
Mortgages payable	1,510,392	1,734,923
Accrued payroll and other expenses	2,357,119	1,787,473
Special expendable funds (Exhibit D)	4,194,245	3,506,375
General fund (Exhibit D)	9,655,354	5,440,344
	<hr/>	<hr/>
TOTAL CURRENT FUNDS AND LIABILITIES	22,994,690	17,459,959
	<hr/>	<hr/>
ENDOWMENT FUNDS (Exhibits D and E)	81,742,726	79,744,968
	<hr/>	<hr/>
PLANT FUNDS (Exhibit D):		
Replacement funds	29,207,786	27,012,847
	<hr/>	<hr/>
Building funds:		
Fund balances — (deficit)	(3,410,397)	2,316,208
Loan to building funds from unrestricted endowment funds ..	6,000,000	
	<hr/>	<hr/>
Building funds — net	2,589,603	2,316,208
	<hr/>	<hr/>
Capital invested in property and equipment	76,082,973	70,709,031
	<hr/>	<hr/>
TOTAL	\$212,617,778	\$197,243,013
	<hr/>	<hr/>

See accompanying statement of significant accounting policies.

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENT OF OPERATING INCOME AND EXPENSES

For the Years Ended December 31, 1972 and 1971

	<i>December 31</i>	
	<u>1972</u>	<u>1971</u>
OPERATING INCOME:		
Care of patients.....	\$74,969,626	\$68,505,517
Other services	5,589,250	5,511,564
Transfer from special expendable funds for research, educational and other purposes (Exhibit D).....	2,223,030	2,176,641
TOTAL OPERATING INCOME.....	<u>82,781,906</u>	<u>76,193,722</u>
OPERATING EXPENSES:		
Administration	636,234	594,391
Assistant Secretary-Treasurer	1,178,843	1,055,043
Comptroller	3,635,808	3,152,068
Public interest	335,236	339,297
Non-professional services:		
Buildings and grounds.....	9,592,591	9,416,516
Food service	5,652,406	5,420,013
Other non-professional services.....	2,056,393	1,816,453
Personnel and protective	1,372,872	1,380,064
Professional services:		
Nursing	23,566,846	22,363,196
Professional staff, doctors' offices and research.....	11,090,936	9,768,605
Special services	15,123,709	13,499,095
Vanderbilt Clinic and other.....	7,374,865	6,830,672
Provision for depreciation	3,813,073	3,613,125
TOTAL OPERATING EXPENSES.....	<u>85,429,812</u>	<u>79,248,538</u>
OPERATING LOSS	<u>2,647,906</u>	<u>3,054,816</u>
OTHER INCOME:		
Investment income (Exhibit C):		
Restricted for operating expenses.....	383,906	380,609
Appropriated for operating expenses	2,062,096	2,056,380
Contributions	498,143	400,443
TOTAL OTHER INCOME.....	<u>2,944,145</u>	<u>2,837,432</u>
NET OPERATING INCOME (LOSS) (transferred to general fund — Exhibit D)	<u>\$ 296,239</u>	<u>\$ (217,384)</u>

See accompanying statement of significant accounting policies.

EXHIBIT C

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF INVESTMENT INCOME

For the Years Ended December 31, 1972 and 1971

	<i>December 31</i>	
	<i>1972</i>	<i>1971</i>
INVESTMENT INCOME	<u>\$ 5,654,625</u>	<u>\$ 5,566,559</u>
DISTRIBUTION THEREOF:		
Investment income restricted for:		
Operating expenses (Exhibit B)	\$ 383,906	\$ 380,609
Special expendable funds (Exhibit D)	990,301	963,562
Replacement funds (Exhibit D)	1,222,298	1,108,600
Building funds (Exhibit D)	308,659	371,948
Investment income appropriated for:		
Operating expenses (Exhibit B)	2,062,096	2,056,380
Additional facilities and equipment (Exhibit D)	<u>687,365</u>	<u>685,460</u>
TOTAL	<u>\$ 5,654,625</u>	<u>\$ 5,566,559</u>

See accompanying statement of significant accounting policies.

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1972 and 1971

GENERAL FUND

	December 31	
	1972	1971
Balance, January 1.....	\$ 5,440,344	\$ 7,175,764
Add:		
Legacies and grants	278,647	120,133
Investment income appropriated for expenditures for additional facilities and equipment (Exhibit C).....	687,365	685,460
Net operating income (loss) (Exhibit B).....	296,239	(217,384)
Transfer from (to) other funds — net.....	3,988,580	(2,321,375)
Received from Columbia-Presbyterian Medical Center Fund, Inc.....	7,500	
Medicare and other rate adjustments for prior years.....	134,592	1,354,224
	<u>5,392,923</u>	<u>(378,942)</u>
Total	10,833,267	6,796,822
Deduct:		
Expenditures for additional facilities and equipment.....	1,177,913	1,356,478
Balance, December 31	<u>\$ 9,655,354</u>	<u>\$ 5,440,344</u>

SPECIAL EXPENDABLE FUNDS

(For Research, Educational and Other Purposes)

Balance, January 1.....	\$ 3,506,375	\$ 3,094,555
Add:		
Legacies, contributions and grants.....	1,946,580	1,872,011
Investment income (Exhibit C).....	990,301	963,562
Miscellaneous	1,154,249	1,358,021
	<u>4,091,130</u>	<u>4,193,594</u>
Total	7,597,505	7,288,149
Deduct:		
Transfers to:		
Operating income (Exhibit B).....	2,223,030	2,176,641
Other funds — net	13,255	330,356
Expenditures for property and equipment.....	201,418	96,460
Miscellaneous	965,557	1,178,317
	<u>3,403,260</u>	<u>3,781,774</u>
Balance, December 31	<u>\$ 4,194,245</u>	<u>\$ 3,506,375</u>

ENDOWMENT FUNDS

Balance, January 1.....	\$79,744,968	\$80,329,676
Add:		
Legacies, contributions and grants.....	671,075	58,579
Gain or (loss) from investments sold or redeemed.....	1,330,233	(472,188)
	<u>2,001,308</u>	<u>(413,609)</u>
Deduct:		
Transfers to other funds — net.....	3,550	171,099
Balance, December 31	<u>\$81,742,726</u>	<u>\$79,744,968</u>

EXHIBIT D (Continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1972 and 1971

PLANT FUNDS

	December 31	
	1972	1971
REPLACEMENT FUNDS:		
Balance, January 1	\$27,012,847	\$23,880,575
Add:		
Funding of depreciation	3,813,073	3,613,125
Investment income (Exhibit C)	1,222,298	1,108,600
Gain or (loss) from investments sold or redeemed	417,333	(123,069)
	<u>5,452,704</u>	<u>4,598,656</u>
Total	<u>32,465,551</u>	<u>28,479,231</u>
Deduct:		
Replacements and rearrangements	3,257,765	1,466,384
Balance, December 31	<u>\$29,207,786</u>	<u>\$27,012,847</u>
BUILDING FUNDS:		
Balance, January 1	\$ 2,316,208	\$ 2,706,607
Add:		
Legacies, contributions and grants	2,349,108	1,335,423
Investment income (Exhibit C)	308,659	371,948
Gain or (loss) from investments sold or redeemed	53,906	(229,409)
Received from Columbia-Presbyterian Medical Center Fund, Inc.	83,202	
Loan from unrestricted endowment funds	6,000,000	
Miscellaneous	214	(43,303)
	<u>8,795,089</u>	<u>1,434,659</u>
Total	<u>11,111,297</u>	<u>4,141,266</u>
Deduct:		
Expenditures for property and equipment	4,549,919	4,647,888
Transfers to (from) other funds — net	3,971,775	(2,822,830)
	<u>8,521,694</u>	<u>1,825,058</u>
Balance, December 31	<u>\$ 2,589,603</u>	<u>\$ 2,316,208</u>
CAPITAL INVESTED IN PROPERTY AND EQUIPMENT:		
Balance, January 1	\$70,709,031	\$66,754,946
Add:		
Transfers from:		
General fund	1,177,913	1,356,478
Special expendable funds	201,418	96,460
Building funds	4,549,919	4,647,888
Replacement funds	3,257,765	1,466,384
	<u>9,187,015</u>	<u>7,567,210</u>
Total	<u>79,896,046</u>	<u>74,322,156</u>
Deduct:		
Provision for depreciation	3,813,073	3,613,125
Balance, December 31	<u>\$76,082,973</u>	<u>\$70,709,031</u>

See accompanying statement of significant accounting policies.

EXHIBIT E

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
SCHEDULE OF ENDOWMENT FUNDS

December 31, 1972

THE PRESBYTERIAN HOSPITAL:

Adam, George Aubrey	\$ 3,374,093
Anonymous	189,403
Anonymous — For Support of	
Residency Training	148,705
Arnstein, Daniel G.....	377,782
Atchley, Dr. Dana W.....	1,452,377
Baker, Frances E.....	13,415
Baker, Mrs. Frederick,	
Pathological Department	12,300
Briddon, C. K., Gold Medal.....	3,534
Brookman, Henry D.....	72,346
Bruenn, Dr. Howard G.....	44,707
Cardiac Monitoring Fund of the	
Department of Medicine	70,819
Carle, Robert W., Endowed Room...	412,405
Carle, Robert W. and Adels S.,	
Endowed Room	59,234
Cary, Caroline Catherine	70,233
Cary, The, Endowment Fund	135,653
Coakley, Cornelius G.....	36,402
Coakley, Cornelius G., Memorial....	517,420
Coakley, Louise Perry	374,062
Colgate, Hannah, Memorial	87,462
Collins, Perry McDonough	794,362
Columbia University for Vanderbilt	
Clinic and Sloane Hospital	1,976,823
Commonwealth, The, Fund for Eye	
Institute	657,731
Cooper, Charles P. and Leonora P....	54,764
Cragin Fund	99,576
Davis, Isabel G.....	1,134,085
Delano, Moreau	5,787
Department of Surgery.....	94,200
Dodge, The Cleveland H.....	449,272
Dortic Memorial	142,457
Dows, Mrs. David.....	11,141
Dows, Margaret E.....	7,756
Educational and Scientific Work.....	413,139
Eichner, Joseph Herman and Hannah,	
in Memory of	12,408
Eidlitz, Otto M.....	594,736
Eidlitz, Robert J.....	267,017
Endowed Bed	3,193,887
Endowed Bed — Research	261,267
Faulkner, The Edward Daniels	
Memorial for Study and Treatment	
of Arthritis	154,833
Feldman, Irving J.....	26,207
Fiske, Fund	150,823
FitzGerald, Frederick H.	
and Josephine F.....	196,023
Flagler, Alice Manderlick	358,168
Foote, Edwin Bancroft	254,586
Ford, George W. and Eliza Lawson...	478,805
Fowler, Dr. Edmund P., Memorial...	5,348
Fracture Endowment Fund	11,970
Fremstad, Anna Olivia	168,422
Frick, The Frances Dixon, Memorial..	50,321
Gaisman, Henry J.....	75,731
General Endowment	1,735,228
Goldschmidt, Henry Philip	7,235
Gondran, Sophie M. and Adolph L...	144,693

Griffith, Griffith W. and	
Mary Jones, Memorial	1,907,633
Haller, Maria L.....	3,775
Harkness, Edward S.	8,954,737
Harkness, Edward S., Memorial	8,956,870
Harkness, Edward S., Research	1,080,818
Harkness, Mary Stillman,	
Memorial Endowment	341,563
Harkness, Mary Stillman,	
Memorial Research	63,426
Harkness, The Mary S., for	
Convalescent Care	1,451,334
Harkness, William Hale, Memorial...	55,074
Hartford, The John A. Foundation...	426,576
Hepatorenal Fund	50,921
Hill, Marguerite S.	7,958
Hirschewitz, Blanche M.	87,563
Ingenthron, May A., Memorial Bed...	31,073
Institute of Ophthalmology, The	4,938,283
Ives, Helen Douglas	162,575
James Foundation of New York	664,457
Jesup, Morris K. and Maria DeWitt ...	144,693
Johnston, Andrew, Memorial Room ..	58,249
Jones, David, Memorial	434,079
Jones, Margarette A.	240,559
Keller Memorial	724
Kennedy, John Stewart	1,393,701
Kinnicutt, The G. Herman, Flower ..	7,235
Knapp, The Herman Memorial Eye	
Hospital Endowed Bed	92,865
Kreisler, Harriet and Fritz	319,133
Krumb, Henry	29,797
Lattimer, Dr. John K.	79,191
Lindley, Erasmus C.	60,203
MacMillin, Isabel, Memorial	1,948,384
Maloy, The Frank and Selena,	
Memorial	30,102
Martin, Frederick Townsend	14,469
Maxwell, Anna C., Memorial Library.	10,362
McCosh, Dr. Andrew J., Memorial ..	144,971
McCreedy, Jeanne Campbell	145,246
McGuire, Mary Madison	356,762
Medical Laboratory Development	
Endowment	277,785
Medical Scientific	514,273
Milbank, Dunlevy	1,184,673
Miller, James, Endowed Room	87,426
Miller, Margaret G.	74,362
Montfort, Barret, Memorial,	
Scholarships	44,425
Morgan, Edward M., Endowed Beds .	55,503
Morgenstern, Morris and Celia,	
Research	19,278
Nathan, Garfield, Arthur	314,063
Ophthalmological Research	105,452
Ottman, for Cancer Research	40,438
Parkin, Alice Temple	60,655
Prostate, Fund for Research	13,512
Quick, The Walter R.	21,194
Research and Development in	
Anesthesiology	277,863
Research and Development in	
Department of Medicine	109,173

EXHIBIT E (Continued)

SCHEDULE OF ENDOWMENT FUNDS

Richards-Cournand Library	21,410
Rivlin, Dr. R. S. Medical Research ..	20,708
Rogers, Henry H., Memorial	40,435
Sage, Dean, Memorial	40,879
Sage, Dean, Scholarship	9,364
Sage, Russell and Margaret Olivia, Memorial	559,191
School of Nursing	1,354,220
School of Practical Nursing	166,371
Secor, Mary E.	49,587
Sherry, The Bertha, Memorial	940,078
Sidman Trust	1,552
Sinclair, The Francis MacDonald, Endowed Room	54,260
Sinclair, The Jennie Hankinson, Endowed Room	54,260
Sloane Hospital	1,133,319
Sloane Hospital Babies' Alumni	36,595
Sloane Hospital Research	36,224
Sloane, The William, Memorial	931,956
Smith, Henrietta H., Periodical	1,159
Society of the Alumni of Presbyterian Hospital	3,739
Soria, Henry J.	110,606
Squier Clinic	102,170
Squier Clinic Fellowship and Resident	62,253
Stein, Jules	38,324
Stevenson, Dr. Thomas W., Memorial.	29,614
Stilson, Ellen J. and Minnie	27,997
Stone, William Ridgley, Memorial ...	100,015
Sturges, Frederick, Jr., Scholarship ..	65,452
Surgical Cancer Research	6,891
Surgical Fellowship	86,815
Taylor, Dr. Alfred S., Memorial	27,793
Taylor, Sarah A. Hard, Endowed Room	63,643
Terry, John T., in Memory of	58,987
Thacher, Frances Lake, Memorial ...	20,187
Tod, J. Kennedy, Memorial	144,840
Tolfree, The Caroline O. and James E., Memorial	226,401
Urological Service Research	108,011
Valentine, Isaac E., Memorial	814,937
Van Norden, Kathryn L.	3,775
Vanderbilt Clinic	1,246,018
Walden, Julia Carroll	204,086
Webster, Dr. Jerome P., Library of Plastic Surgery	85,846
Weinberg, Ruth F.	203,566
Weinberg, The Sidney J., Employees Educational Aid	218,961
Winman, Moses	7,708
Weisl, Alice	459,408
Welles, Frances Swan	14,469
Westlake, Emory H. and Caroline B. .	44,442
Wheeler, The Dr. John M., Memorial.	107,894
Williams, William	487,241
TOTAL	69,970,246

Endowed Bed	59,657
General Endowment	13,118
Harkness, Edward S.	1,735,988
Harkness, Edward S., Educational and Scientific	868,157
Harkness, Mary Stillman, Memorial Endowment	341,563
Kimball, Reuel B.	83,543
Lambert, Dr. Charles I., Memorial ...	13,118
McIntoch, Rustin	3,399
Pratt, Samuel	57,195
Rathbone, R. Bleecker	21,576
Rumson Fund	29,618
Singer, Dr. Milton	69,217
Urological Service Research	6,336
Videre, Leontine, Foundation	14,427
Wilcox, Herbert B., Memorial	4,541
TOTAL	3,364,164

NEUROLOGICAL INSTITUTE:

Blair Memorial	4,525
Endowed Bed — Research	221,084
Masselink, Dr. R., Memorial	5,066
Neurological Institute Auxiliary	16,448
Ogilvie Clinton Memorial	14,425
Schlesinger, Dr. Edward B.	75,012
Sciarra, Madeline	303,970
Zabriskie, Dr. Edwin G., Memorial ..	142,745
TOTAL	783,275

NEW YORK ORTHOPEDIC HOSPITAL:

Bridgman, Statira	3,617
Carroll, Dr. Robert E., Research	15,737
Endowed Bed	897,429
Farrell, Dr. Benjamin P., In Memory of	10,377
General Endowment	1,205,667
Hallock, Dr. Halford, Fellowship	16,348
Hibbs, Russell A., Memorial Library.	77,719
Hurst, The Thomas D. and Kate	7,235
Kane, Annie C., Fellowship	1,446,927
Lantzounis, Dr. Leonidas A., Fellowship	15,638
Orthopedic Surgery Endowment	197,931
Rathbone, R. Bleecker	21,576
Smith, Dr. Alan DeForest, Lectureship	8,147
Tower, Mary T., In Memory of	44,232
Watson, Emily A.	3,620,583
White, Emily Vanderbilt	28,643
Willard, Mary Livingston	7,235
TOTAL	7,625,041

TOTAL ENDOWMENT FUNDS

(See Note) \$81,742,726

NOTE:

In addition to the above endowments the Hospital also receives income from the following non-discretionary trusts:

<i>Trusts</i>	<i>Market Value December 31, 1972</i>
Danziger, Matilda	\$ 93,032
Gould, Edwin	18,986
Jackson, Peter A. H.	490,626
Strong, W. E. S.	746,807
Swan, Helen M. W.	1,426,957

See accompanying statement of significant accounting policies.

THE BABIES HOSPITAL:

Cleft Palate Cases	10,294
Cribside Social Service Committee ...	18,562
Educational Therapy	1,447
Eichner, Joseph Herman and Hannah, in Memory of	12,408

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF SIGNIFICANT ACCOUNTING POLICIES

The Presbyterian Hospital in the City of New York follows fund accounting principles as are customary for not-for-profit entities. Significant accounting policies employed in applying such principles are as follows:

INVESTMENT AND RELATED INCOME

Since 1960, investments and related income of the endowment and plant funds have been administered under the principles governing a common trust fund.

Investments acquired by purchase are carried at cost and those acquired by gift, or bequest, are carried at fair market value at the date of the gift.

Realized gains or losses are distributed to the principal of the funds.

In accordance with the policy approved by the Board of Trustees in January 1971, three-fourths of the unrestricted investment income is appropriated for operating purposes and one-fourth is appropriated for capital expenditures.

UNRESTRICTED GIFTS

Unrestricted gifts designated by the Board of Trustees for particular purposes are credited directly to appropriate funds. Gifts credited to other income in the Statement of Operating Income and Expenses are gifts received as a result of solicitation primarily for free care and other operating purposes.

PROPERTY AND EQUIPMENT

Property and equipment is valued at cost. Straight line depreciation is utilized for all depreciable assets except items of a movable nature. The latter assets, since 1966, are depreciated on an accelerated basis using the double declining method. Cash equivalent to the annual provision for depreciation is transferred from the General Fund to the Replacement Fund, in accordance with the policy approved by the Board of Trustees, effective January 1, 1953.

PENSIONS

The Hospital's policy is to fund pension cost accrued for all active employees. The assets held in the Retirement Fund Trust and Insurance Company reserves exceed the actuarially computed value of vested benefits as of January 1, 1972, the date of the latest actuarial valuation of the retirement plan.

ACCOUNTANTS' OPINION

THE PRESBYTERIAN HOSPITAL

IN THE CITY OF NEW YORK:

We have examined the balance sheet of The Presbyterian Hospital in the City of New York as of December 31, 1972, the related statements of operating income and expenses and of investment income, and summary of fund changes for the year then ended, and the supplemental schedule of endowment funds. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements and supplemental schedule present fairly the financial position of the Hospital at December 31, 1972 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS & SELLS

Certified Public Accountants

New York, N. Y.

January 31, 1973

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL

IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Haskins & Sells, as independent certified public accountants, to make an examination of the financial statements of The Presbyterian Hospital in the City of New York for 1972.

We submit herewith after due consideration by this Committee, an opinion of Haskins & Sells dated January 31, 1973 relating to the Corporation's balance sheet as of December 31, 1972, the related statements of operating income and expenses and of investment income, and summary of fund changes for the year then ended, and the supplemental schedule of endowment funds. Your Committee recommends that the opinion and financial statements be accepted and approved.

JOHN A. GIFFORD, *Chairman*

DORRANCE SEXTON

JAMES W. WALKER

ROBERT WINTHROP

Auditing Committee

New York, N. Y.

January 31, 1973

EXHIBIT F

**GROUP RETIREMENT PLAN ESTABLISHED BY
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK**

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly by a Contract with The Travelers Insurance Company. The amount set aside for retirement benefit purposes, which are not a part of the assets of the Hospital, aggregated \$19,579,323 at December 31, 1972. The total pension expense for 1972 was \$1,999,000, due to prior amortization payments and revision in benefit levels past service costs have been fully amortized. The Hospital's policy is to fund pension cost accrued. The actuarially computed value of vested benefits as of January 1, 1972, the date of latest actuarial valuation of the Plan, was \$18,497,504. In accordance with the Hospital's undertaking under the Group Retirement Plan the amounts already set aside are sufficient to provide for all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled under the Plan. In addition, they include provision for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1972 under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1972 on the Retirement Fund Trust established by the Hospital:

Assets in Fund — January 1, 1972	\$13,391,879
Payments to Fund	1,999,000
Net Income from Investments including Net Profit on Investments Disposed of	352,152
	<u>15,743,031</u>
Disbursements for Retirement Benefits	680,782
Assets in Fund — December 31, 1972	<u>\$15,062,249</u>
Consisting of:	<i>Book Value*</i>
Industrial, Railroad, Public Utilities and Miscellaneous Bonds	\$ 1,892,710
Common Stocks — Equities	10,057,843
Commingled Pension Trust Funds:	
Excluding Common Stocks	49,961
Mortgage — Real Property	1,021,275
Special Situation Investments — Convertibles	675,543
Special Situation Investments — Equities	868,742
Special Situation Investments — Real Estate	493,674
Cash	2,501
	<u>\$15,062,249</u>

* The cash and approximate market value of securities held as of December 31, 1972 totaled \$22,219,479.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,
Trustee

By JAMES M. MCKINNEY,
Assistant Trust Officer

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1972:

Retirement Fund Trust — Morgan Guaranty Trust Company of New York, Trustee	\$15,062,249
Retirement Plan reserves held by Travelers Insurance Company	4,517,074
	<u>\$19,579,323</u>

STATISTICS

Year 1972

	<i>Bed Com- plement(*)</i>	<i>Admissions</i>	<i>Patient Days Care</i>
PRIVATE:			
Presbyterian Hospital (Harkness Pavilion)	220	6,108	75,544
Edward S. Harkness Eye Institute	19	657	4,199
Neurological Institute	63	1,018	20,987
Sloane Hospital	24	856	4,704
Total Private	<u>326</u>	<u>8,639</u>	<u>105,434</u>
SEMI-PRIVATE:			
Presbyterian Hospital and Sloane Hospital:			
All services (Harkness)	104	3,040	34,993
Dermatology	8	106	1,857
Gynecology	13	447	4,162
Hypertension	8	119	1,874
Obstetrics	26	965	4,324
Orthopedic	55	1,066	18,612
Otolaryngology	21	1,294	5,629
Surgery	48	663	12,437
Urology	31	679	8,666
Babies Hospital (including neonatal special care unit of 23 incubators)	55	1,819	21,566
Edward S. Harkness Eye Institute	53	2,290	14,803
Neurological Institute	89	924	25,339
Total Semi-Private	<u>511</u>	<u>13,412</u>	<u>154,262</u>
WARD:			
Presbyterian Hospital and Sloane Hospital:			
Abortion Unit	8	983	983
Admitting	14	829	3,044
Gynecology ..	35	767	8,170
Medicine	101	2,294	32,454
Obstetrics	81	2,855	16,456
Orthopedic	67	1,148	17,801
Otolaryngology	12	401	2,804
Surgery	77	1,865	23,622
Urology	36	644	9,938
Babies Hospital	100	3,041	26,125
Edward S. Harkness Eye Institute	28	733	4,838
Neurological Institute	98	1,354	27,630
Total Ward	<u>657</u>	<u>16,954</u>	<u>173,865</u>
Total	<u>1,494</u>	<u>39,005</u>	<u>433,561</u>
NEWBORNS (Sloane Hospital):			
Private beds	24	428	2,157
Semi-Private and Ward beds	86	2,904	14,168
Total	<u>110</u>	<u>3,332</u>	<u>16,325</u>

(*) As of December 31.

OUT-PATIENT DEPARTMENT STATISTICS

Summary of Patients Treated:

	1972	1971
Number of patients treated	61,727	60,920
Number of visits:		
Medicare	55,655	56,076
Medicaid	172,937	150,658
Full Pay	6,007	9,498
Part Pay	128,690	117,816
Personnel and Dependents	14,838	14,316
Free	12,689	11,345
Transfers	4,129	1,705
Follow-ups	2,377	2,839
Charges and Miscellaneous Agencies	35,572	36,517
Total	432,894	400,770
Average visits per work day	1,792	1,590

Attendance Statistics:

	New to Clinics	Revisits	Total Visits
Dermatology	7,099	15,136	22,235
Emergency and Admitting Wards	16,300	30,085	46,385
Group Clinic	3,942	18,761	22,703
Medicine	6,520	26,738	33,258
Neurology	2,468	12,551	15,019
Obstetrics and Gynecology	17,770	31,114	48,884
Ophthalmology	5,386	22,667	28,053
Orthopedic	13,720	20,397	34,117
Otolaryngology	3,626	13,326	16,952
Pediatrics	27,364	34,816	62,180
Physical Medicine and Rehabilitation	472	11,895	12,367
Psychiatry	1,231	12,667	13,898
Surgery	25,044	40,657	65,701
Urology	1,459	9,683	11,142
Total	132,401	300,493	432,894

On Duty
December 31

PERSONNEL STATISTICS

	1972	1971
Administration	16	13
Assistant Secretary Treasurer	112	109
Comptroller	205	199
Public Interest	24	25
Non-professional services:		
Buildings and grounds	660	670
Food service	341	332
Personnel and protective	116	116
Other non-professional services	169	168
Professional services:		
Nursing	1,829	1,833
Professional staff, doctors' offices and research	502	466
Special services	839	814
Vanderbilt Clinic and other	456	442
Total	5,269	5,190
Student:		
Department of Nursing, Faculty of Medicine Columbia University	288	307
Columbia-Presbyterian School of Practical Nursing	61	61
Presbyterian Hospital School of:		
Radiologic Technology	28	27
Operating Room Technology	9	14
Orthoptic and Ophthalmic Assistants	3	3
Electroencephalographic Technology	3	-
Total	392	410

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

(Including Cribside Social Service Committee)

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1972 and 1971

	1972	1971
Balance, January 1.....	\$ —	\$ 5,878.01
Receipts:		
Membership dues	1,260.00	1,815.00
Interest on investments.....	999.45	990.90
Greater New York Fund.....	14,107.00	14,171.00
United Hospital Fund:		
Free Care Distribution	6,980.00	5,990.00
Direct Benefit	10,653.00	13,762.00
Special Projects:		
Everybody's Thrift Shop	16,914.69	19,471.31
Donations	2,215.00	1,520.00
Payments by patients for convalescent care, etc.....	—	220.00
Theatre Benefit	21,730.00	—
Transfer net proceeds of Theatre Benefit to Discretionary Fund of The Babies Hospital Board of Women Managers.....	(11,212.01)	—
Total Receipts	63,647.13	57,940.21
	63,647.13	63,818.22
Disbursements:		
Used for the Care of Ward and Clinic patients.....	10,653.00	13,762.00
Emergency Nursing Fund	4,000.00	4,000.00
Recreational Therapy	4,500.00	4,500.00
Pediatric Psychiatric Clinic	1,500.00	1,500.00
Volunteers	500.00	500.00
Salaries	24,156.68	24,493.91
Administration	30.00	458.71
Social Service Summer Salary for College Student.....	—	1,035.61
Social Service Department — General Expenses.....	1,200.00	—
Social Service Expenditures for Patients:		
Maintenance	168.69	971.50
Appliances	75.25	1,411.65
Clothing	12.87	754.86
Cribs and Carriages	—	600.33
Transportation of patients	428.50	1,037.50
Summer Camps	150.00	3,734.00
Other	347.93	417.09
T.V. Sets for Patient Areas	—	990.00
Special Projects:		
Thrift Shop Expenditures	1,388.00	1,250.00
Theatre Benefit	8,335.99	2,182.00
Recreational Therapy Department Movie Program.....	1,000.00	—
Miscellaneous	239.84	219.06
Total Disbursements	58,686.75	63,818.22
Balance, December 31.....	\$ 4,960.38	\$ —

PATRICIA MUNN, Treasurer

NEUROLOGICAL INSTITUTE AUXILIARY
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1972 and 1971

	1972	1971
Balance, January 1	\$14,285.54	\$14,419.80
Receipts:		
Interest on investments	169.51	168.05
Donations and membership dues	13,975.00	17,868.75
United Hospital Fund:		
Free Care Distribution	6,262.00	5,374.00
Direct Benefit	17,196.00	9,920.00
Greater New York Fund	12,658.00	12,715.00
Everybody's Thrift Shop	12,614.25	16,699.54
Auxiliary Benefit	—	18,883.76
Payments by patients of advances and loans	952.00	1,342.00
Receipt for prior year expenditure for Research Psychologist	5,500.00	—
Total Receipts	69,326.76	82,971.10
	83,612.30	97,390.90
Disbursements:		
Social service salaries	15,949.63	9,569.27
To Neurological Institute for:		
Care of Clinic and Ward patients	17,196.00	9,920.00
Library	7,000.08	6,753.36
Social Service Scholarships	1,000.00	3,250.00
Volunteer Service	1,900.00	1,900.00
Recreational Therapist	2,278.12	6,354.74
Nurse Specialist — Neurology Clinic	3,675.00	3,675.00
Social Service — Case Aide	—	1,785.57
Social Service Salary for College Student	1,075.08	1,062.17
Research Psychologist	—	5,500.00
Research Care Study	870.00	—
Social services expenditures for patients:		
Summer Camps	14,617.50	20,214.50
Transportation	1,477.65	1,099.43
Medical Appliances and Maintenance	415.95	499.18
Emergency Assistance	—	—
Clothing	60.00	112.50
Homemaker	551.20	125.00
Other	86.25	808.06
Staff Travel	119.90	106.22
Everybody's Thrift Shop	1,020.90	550.00
Auxiliary Benefit	—	8,791.52
Miscellaneous, Postage, Telephone and Publications	996.14	1,028.84
Total Disbursements	70,289.40	83,105.36
Balance, December 31	\$13,322.90	\$14,285.54

NANCY FESSENDEN, *Treasurer*

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1972 and 1971

	<u>1972</u>	<u>1971</u>
Balance, January 1	\$15,292.09	\$17,784.45
Receipts:		
Donations	10,113.52	12,482.72
Investment Income used in Recreational Therapy	2,007.30	1,990.07
United Hospital Fund:		
Direct Benefit	19,692.00	18,962.00
Free Care Distribution	2,965.00	2,544.00
Greater New York Fund	5,993.00	6,021.00
Total Receipts	<u>40,770.82</u>	<u>41,999.79</u>
	<u>56,062.91</u>	<u>59,784.24</u>
Disbursements:		
Recreational therapist salary	21,524.08	20,400.93
Other recreational therapy expenses	561.28	192.60
To Presbyterian Hospital for:		
Care of Ward and Clinic patients	19,692.00	18,962.00
Library	2,633.35	2,551.10
Volunteer Service	1,100.00	1,100.00
Miscellaneous	244.30	1,285.52
Total Disbursements	<u>45,755.01</u>	<u>44,492.15</u>
Balance, December 31	<u>\$10,307.90</u>	<u>\$15,292.09</u>

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1972 and 1971

	1972	1971
Balance, January 1	\$10,027.80	\$11,355.28
Receipts:		
Membership dues	1,153.00	1,313.00
United Hospital Fund:		
Free Care Distribution	3,936.00	3,378.00
Direct Benefit	23,923.00	17,667.00
Greater New York Fund	7,955.00	7,991.00
Donations	—	47.00
Auxiliary Benefit	—	1,141.25
Stuyvesant Square Thrift Shop	25,634.61	24,655.10
Total Receipts	<u>62,601.61</u>	<u>56,192.35</u>
	<u>72,629.41</u>	<u>67,547.63</u>
Disbursements:		
To Presbyterian Hospital:		
Care of Ward and Clinic patients	23,923.00	17,667.00
Occupational Therapy	—	6,000.00
Library	10,050.00	14,043.44
Volunteer Service	7,620.00	7,560.00
Recreational Therapy	6,130.30	9,514.12
Student Nurse Scholarship Fund	500.00	500.00
Anna Ball Kneeland Memorial Fund for Staff Development in Social Service..	500.00	800.00
Emily Webster Fund	500.00	500.00
Miscellaneous	820.80	935.27
Total Disbursements	<u>50,044.10</u>	<u>57,519.83</u>
Balance, December 31	<u>\$22,585.31</u>	<u>\$10,027.80</u>

CAROLYN A. BUDA, *Treasurer*

ANNA BALL KNEELAND MEMORIAL FUND
FOR STAFF DEVELOPMENT IN SOCIAL SERVICE

For the Years 1972 and 1971

	1972	1971
Balance, January 1	\$ 1,191.53	\$ 591.53
Receipts:		
Women's Auxiliary of The Presbyterian Hospital	500.00	800.00
Other	110.00	200.00
Total Receipts	<u>610.00</u>	<u>1,000.00</u>
	<u>1,801.53</u>	<u>1,591.53</u>
Disbursements:		
Seminar and Staff Development	730.00	400.00
Spanish Lessons and Books for Social Service Staff	893.75	—
Total Disbursements	<u>1,623.75</u>	<u>400.00</u>
Balance, December 31	<u>\$ 177.78</u>	<u>\$ 1,191.53</u>

EXHIBIT A

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

BALANCE SHEET

December 31, 1972 and 1971

ASSETS

	<i>December 31,</i>	
	<i>1972</i>	<i>1971</i>
CURRENT FUNDS ASSETS:		
Cash	\$ 104,259	\$ 39,504
Bonds and stocks—at cost or contributed value (quoted market value—1972, \$240,952; 1971, \$401,620)	240,798	401,602
Interest and dividends receivable, etc.	21,059	30,486
TOTAL CURRENT FUNDS ASSETS.	<u>366,116</u>	<u>471,592</u>
ENDOWMENT FUNDS ASSETS:		
Cash	1,946	10,003
Bonds and stocks—at cost or contributed value (quoted market value—1972, \$3,778,076; 1971, \$3,400,697)	3,681,534	3,783,818
TOTAL ENDOWMENT FUNDS ASSETS.	<u>3,683,480</u>	<u>3,793,821</u>
TOTAL	<u>\$4,049,596</u>	<u>\$4,265,413</u>

FUNDS AND LIABILITIES

CURRENT FUNDS AND LIABILITIES:		
Accrued expenses and accounts payable.	\$ 5,697	\$ 14,706
Special expendable funds	297,351	336,368
General fund	63,068	120,518
TOTAL CURRENT FUNDS AND LIABILITIES.	<u>366,116</u>	<u>471,592</u>
ENDOWMENT FUNDS	<u>3,683,480</u>	<u>3,793,821</u>
TOTAL	<u>\$4,049,596</u>	<u>\$4,265,413</u>

NOTES:

The Columbia-Presbyterian Medical Center Fund, Inc. was established January 21, 1960 to obtain funds to be used for the joint educational, scientific and charitable purposes now carried on by The Presbyterian Hospital in the City of New York and The Trustees of Columbia University in the City of New York through the Columbia-Presbyterian Medical Center.

The Fund's financial statements do not include amounts contributed directly to Columbia University or The Presbyterian Hospital in the City of New York for the development of the Columbia-Presbyterian Medical Center. The Fund follows fund accounting principles as are customary for not-for-profit entities.

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1972 and 1971

GENERAL FUND

	December 31, 1972	1971
Balance, January 1	\$ 120,518	\$ 151,980
Add:		
Unrestricted contributions, legacies and grants	83,269	27,581
Investment income	4,894	5,794
TOTAL	88,163	33,375
Deduct—Fund raising expenses for Columbia-Presbyterian Medical Center development program:		
Secretarial and clerical staff	47,090	44,729
Other expenses	44,125	23,275
TOTAL	91,215	68,004
Unrestricted contributions, legacies and grants and investment income over (under) expenses	(3,052)	(34,629)
TOTAL	117,466	117,351
Add (Deduct) Grants, and Transfers—Net:		
Transfers from (to) Columbia University	(57,410)	10,496
Transfers to Presbyterian Hospital	(67,470)	(5,043)
Transfers from (to) special expendable funds—net	70,482	(2,286)
Net	(54,398)	3,167
Balance, December 31	\$ 63,068	\$ 120,518

SPECIAL EXPENDABLE FUNDS

(For Construction, Faculty Salaries and Other Purposes)

Balance, January 1	\$ 336,368	\$ 362,360
Add:		
Contributions	51,431	31,555
Investment income	163,723	163,432
TOTAL	215,154	194,987
Deduct:		
Grants to:		
Presbyterian Hospital:		
For construction purposes	32,852	
For faculty salaries	19,582	23,965
Columbia University:		
For construction purposes		63,641
For faculty salaries	95,468	117,001
For fellowships	35,000	14,951
Transfers to (from) general fund—net	70,482	(2,286)
Transfers to endowment funds	787	3,707
TOTAL	254,171	220,979
Balance, December 31	\$ 297,351	\$ 336,368

EXHIBIT B (Continued)

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1972 and 1971

ENDOWMENT FUNDS

	December 31,	
	1972	1971
Balance, January 1.....	\$3,793,821	\$3,807,282
Add (Deduct):		
Net loss on sale of securities.....	(111,178)	(22,218)
Contributions	50	5,050
Transfers from special expendable funds.....	787	3,707
	(110,341)	(13,461)
Balance, December 31.....	\$3,683,480	\$3,793,821

EXHIBIT C

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

SCHEDULE OF ENDOWMENT FUNDS

December 31, 1972

Anesthesiology, Fund for Endowed Chair in.....	\$ 19,462
Auchincloss, Dr. Hugh, Memorial Endowment Fund.....	655,712
Commonwealth Fund Endowment for Faculty Uses.....	2,450,844
General Endowment Fund.....	533,815
Webster Library Endowment Fund.....	23,647
TOTAL ENDOWMENT FUNDS.....	\$3,683,480

ACCOUNTANTS' OPINION

COLUMBIA-PRESBYTERIAN
MEDICAL CENTER FUND, INC.

We have examined the balance sheet of Columbia-Presbyterian Medical Center Fund, Inc. as of December 31, 1972 and the related summary of fund changes for the year then ended and the supplemental schedule of endowment funds. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of the Fund at December 31, 1972 and, in summarized form, the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS & SELLS
Certified Public Accountants

New York, N. Y.
February 22, 1973

COLUMBIA UNIVERSITY-PRESBYTERIAN HOSPITAL
SCHOOL OF NURSING ALUMNAE ASSOCIATION, INC.

STATEMENT OF ASSETS, LIABILITIES AND FUNDS

December 31, 1972 and 1971

ASSETS

	1972	1971
Capital Funds — securities and cash	\$1,248,921.23	\$1,193,115.09
Operating Funds — securities, cash and accrued dividends and interest receivable	48,808.14	45,028.68
Total Assets	<u>\$1,297,729.37</u>	<u>\$1,238,143.77</u>

LIABILITIES AND FUNDS

Capital Fund Reserves:		
General Fund	\$ 73,686.15	\$ 62,925.70
Benefit Fund	260,807.33	251,088.81
Pension Fund	762,806.16	734,501.63
Helen Young Memorial Fund	9,210.79	8,870.55
Dominick Fund for Needy Members	5,193.12	5,000.00
Scholarship Funds:		
Josephine C. Brown Fund	2,785.25	2,488.71
Janet B. Christie Fund	4,448.51	4,092.17
Helen Cunningham Fund	3,469.38	3,149.83
M. Elizabeth Deans Howell Fund	3,033.32	2,822.98
Dorothy DeGraff Keim Fund	3,569.41	3,290.67
Emma B. Kennedy Fund	45,018.30	43,349.26
Ethel Burnham Kernohan Fund	2,444.12	2,256.75
Memorial Fund '20	6,264.04	6,029.55
June Moore Fund	2,790.81	2,494.27
Sarah C. Nadel Fund	1,965.15	1,700.78
Richard William Walsh Fund	3,463.47	3,334.73
Ruth C. Williams Fund	6,619.38	6,275.69
Helen Young Fund	51,346.54	49,443.01
Total Capital Fund Reserves	1,248,921.23	1,193,115.09
Operating Funds Reserves	46,687.82	41,143.97
Liabilities	2,120.32	3,884.71
Total Liabilities and Funds	<u>\$1,297,729.37</u>	<u>\$1,238,143.77</u>

SUMMARY OF RECEIPTS AND DISBURSEMENTS

Cash Balance, January 1	\$ 13,191.12	\$ 12,341.21
Receipts:		
Sale of securities	448,219.85	474,747.65
Investment income	65,669.88	68,721.25
Donations	14,457.38	13,859.96
Dues and initiation fees	22,596.50	21,730.00
Miscellaneous	5,575.17	4,558.47
Total Receipts	556,518.78	583,617.33
	569,709.90	595,958.54
Disbursements:		
Purchase of securities	438,299.61	491,716.18
Clerical expense and fees	13,771.00	12,945.00
Pensions and benefits paid	48,780.00	47,277.20
Scholarship granted	10,367.20	15,530.00
Printing, stationery and postage	10,078.32	7,317.71
Miscellaneous	11,585.11	7,981.33
Total Disbursements	532,881.24	582,767.42
Cash Balance, December 31	<u>\$ 36,828.66</u>	<u>\$ 13,191.12</u>

MARGARET WELLS, *Treasurer*

Endowed Beds and Rooms

(1) A gift of \$10,000, specified for an endowed ward bed, shall entitle the donor to nominate a patient to use and occupy one bed in the common wards of the Hospital free of charge (except for special services) for not more than 90 days in any one year.

The donor may at the time of making the gift appoint another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only: —

(a) During the life of the person having the right to nominate, if such right is in an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

(2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment and discharge of patients.

(3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the objectives for which the Hospital was established and is maintained.

(4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

A gift of \$10,000 shall entitle the donor to establish as permanent memorial one memorial endowed bed for research purposes in a ward of the Hospital to be used and occupied by patients free of charge, except for special service.

The President of the Medical Board shall, subject to the approval of the President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes for not more than ninety days in any one year for a period of fifteen years, subject to all rules and regulations governing the admission, treatment and discharge of patients. This privilege shall be assigned to the persons occupying these respective offices (President of the Medical Board and President of the Hospital) at the time the nomination is made.

ENDOWED ROOMS

The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of rooms on such terms and conditions as they may deem best calculated to promote the objectives for which the Hospital was established and is maintained.

Endowed Beds and Rooms Presbyterian Hospital

1868 Mary J. Gelston

1870 Henrietta A. Lenox (2 Beds)
Washington R. Vermilyea
A. R. Wetmore

1871 Estate of John Laurie
Mary Ann Parish

1872 William Earl Dodge
John T. Johnston
Otis D. Swan
Henry Young (2 Beds)

1873 James Brown (2 Beds)
John R. Ford
Jonathan Sturges

1878 James G. and Henry G. deForest, in memory of
Lockwood deForest Woodruff, M.D.

1880 William C. Rhineland

1881 Jennet L. and Robert L. Belknap, in memory of
Aaron B. Belknap
Fifth Avenue Presbyterian Church
Henry B. Hyde, in memory of his son,
Henry B. Hyde, Jr.
John Stewart Kennedy
Frederick and Henry G. Marquand
Edwin D. Morgan (3 Beds)
Mary L. Sheafe
John L. Proudfit

1882 Heber R. Bishop (3 Beds)
Mrs. Robert L. Stuart, in memory of her father,
Robert McCrea
Edwin D. Morgan
Mrs. Moses Taylor

1883 Frederick Billings
Reformed Protestant Dutch Church of the
City of New York

1884 Rev. Nathaniel W. Conkling, D.D.
West Presbyterian Church, to be known as the
"Faith Presbyterian Church Bed"
Madison Square Presbyterian Church, in memory
of George W. Lane

1885 Brick Presbyterian Church, in memory
of Dr. John G. Adams
Richard Irvin

1886 Frederick Baker, in memory of
Sarah Pyewell Baker
Estate of Dr. Edward Langdon Beadle
Brick Presbyterian Church, in memory of
Miss Ann Adams
Fourth Avenue Presbyterian Church Bed by Peter
Cumming, in memory of Francis P. Schoals
George E. Dodge
Horace F. Hutchinson, in memory of
Ellen B. Schoals
Mr. and Mrs. William D. Sloane, in memory of
their son, William D. Sloane, Jr.
Henry S. Wilson, in memory of his son,
Harry H. Wilson

1887 Fifth Avenue Presbyterian Church

1888 Broadway Tabernacle Society
Samuel Inslee, in memory of Kate J. Inslee

1889 John Sloane, in memory of his mother,
Euphemia Sloane

1890 Isaac V. Brokaw, in memory of Ernest B. Brokaw
Sidney Dillon, in memory of Hannah Dillon
Ambrose K. Ely
Josiah M. Fiske
Oliver Burr Jennings

- Mrs. John Stewart Kennedy
Amelia Kerr
Fourth Presbyterian Church by Estate of
Robert Marshall
Elizabeth D. and Emily M. Wheeler, in memory
of James Boorman, to be known as
"The Davenport Bed"
- 1891 Hector C. Havemeyer Bed, by
Sarah A. Havemeyer, in memory of her son
Estate of Thomas Hope
Mrs. A. R. Van Nest, in memory of her husband,
Abram R. Van Nest
- 1892 John Stewart Kennedy, in memory of his niece,
Emma Stewart Baker
Alexander Maitland, in memory of his mother,
Mary C. Maitland
- 1893 Maria S. Auchincloss, in memory of her husband,
Edgar S. Auchincloss
Frances T. Lord, in memory of her husband,
George deForest Lord
Presbyterian Church on University Place
Presbyterian Home for Aged Women
Margaret A. Sinclair, in memory of her parents,
Mr. and Mrs. James Sinclair
West Presbyterian Church
Young Men's Christian Association
- 1895 Matilda A. Brown, in memory of her son,
H. Auchincloss Brown
Mary Harrison
Mrs. Clarence M. Hyde, in memory of her mother,
Rebecca Babbitt
John Stewart Kennedy, in memory of
Mrs. Robert L. Stuart
Mrs. James T. Murray, in memory of her husband,
James T. Murray
- 1896 Anthony Dey, in memory of Joseph G. and
Eliza D. Scott
Jane Hope
Esther J. Jennings, in memory of her husband,
Oliver B. Jennings
- 1897 Mrs. Frances E. Baker, in memory of her father,
James Rich Steers
William Smith Brown
Helen Miller Gould, in memory of her parents,
Mr. and Mrs. Jay Gould
Margarette E. and Susan D. Griffith, in memory of
their father, Griffith W. Griffith
Mary J. Griffith, in memory of her husband,
Griffith W. Griffith
Rachael L. Kennedy, in memory of her mother,
Mrs. Rachael C. Kennedy
Annie S. Paton, in memory of her husband,
William Paton
Charlotte H. Skidmore, to be known as
"The William L. Skidmore Bed"
- 1898 Brick Presbyterian Church
First Presbyterian Church
Mrs. Stephen V. Harkness, in memory of her
daughter, Florence Harkness
Jane Hope, in memory of her mother,
Grace Corrie Hope
John Stewart Kennedy, in memory of
Rev. William G. Schauffler, D.D., LL.D.
- Mrs. Elliott F. Shepard, in memory of her
daughter, Florence Vanderbilt Shepard
Mrs. Elliott F. Shepard, in memory of her
daughter, Marguerite Vanderbilt Shepard
- 1899 William W. Cole, in memory of his mother,
Mary A. Cole
Estate of William Whitewright, in memory of his
father, William Whitewright, "The Whitewright
Beds" (10 Beds)
- 1900 Emily B. Hopkins, in memory of her husband,
Moses Hopkins, "Moses Hopkins Memorial"
Donald MacKay, in memory of his children,
Edith Winslow and Walter Wise MacKay
Caroline L. Macy, in memory of her daughter,
Mary M. K. Willets
Estate of Alexander M. Proudfit, to be known as
the "John McLean Proudfit Bed"
Laura Roome, in memory of her sons,
Harry and Alfred Roome
Martha L. St. John, in memory of her mother,
Sarah Ward
Nathaniel Whitman
- 1901 Julia Billings, in memory of her husband,
Frederick Billings
Camilla L. Edwards, in memory of her husband,
Walter Edwards
Andrew J. Garvey, in memory of his mother,
Elizabeth Jeffries Garvey (2 Beds)
George Lauder
Charles H. Marshall
John E. Parsons, in memory of his children,
E.L.P., K.M.P., and R.M.P.
Justine Adele Stafford, in memory of her father,
Justin A. Bliss
- 1902 Robert Graham Dun
Margaret J. Plant, in memory of her brother,
Simon Loughman
- 1903 Heber R. Bishop
Laura Currier
Mrs. Francis B. Harrison
Julia J. MacCartee, in memory of her husband,
Robert MacCartee
Madison Avenue Reformed Church
Adele Berry Sloane, in memory of her father,
Abraham J. Beery, M.D.
Justine Adele Stafford, in memory of her mother,
Evelina C. Bliss
John T. Terry
- 1904 Virginia E. Fowler, in memory of
Clarence E. Fowler
Susan Bevier
Mrs. William Starr Miller
Josephine Penfold, in memory of
Dr. Edward Livingston Trudeau, Jr.
Peter Reid, in memory of his wife,
Jane Watson Reid
Francis A. Palmer
- 1905 Frederick G. Bourne
Mr. and Mrs. Albert H. Gallatin
Helen C. Inslee, in memory of her husband,
Samuel Inslee
Titus B. Meigs, in memory of his son,
Titus B. Meigs, Jr.

- Mrs. James T. Murray, in memory of
Rev. John Hall, D.D., LL.D.
Sarah J. Parsons, in memory of her husband,
Charles Parsons
Presbyterian Church on University Place
- 1906 Maria L. Campbell, in memory of
Henry Pearsall Campbell
Susan W. Duncan, in memory of her husband,
John P. Duncan
Samuel Keyser (3 Beds)
Sara Pyle McAlpin and James Tolman Pyle,
in memory of their father, William Scott Pyle
The Reformed Protestant Dutch Church in
Garden Street
John Sloane, in memory of his brother,
Thomas Chalmers Sloane
John Sloane, in memory of his father,
William Sloane
- 1908 William R. Craig, in memory of his sister,
Florence Faxon Craig
George B. Goldschmidt, in memory of his mother,
Celestine Goldschmidt
Samuel Anthony Goldschmidt, in memory of his
mother, Celestine Goldschmidt
Mrs. Stephen V. Harkness, in memory of her
husband, Stephen V. Harkness
Charles H. Marshall, Jr.
- 1909 Rev. and Mrs. Robert Russell Booth, in memory
of "Minnie and Willie"
Canadian Society of New York
Edward West Currier, in memory of his
stepmother, Laura Currier
Edward West Currier, in memory of his
stepbrother, Walter B. Currier
Edward West Currier, in memory of
Edward W. Currier
Estate of Mary Jane Johnson, in memory of her
husband, William H. Johnson
J. Theresa Keyser, in memory of her husband,
Samuel Keyser
Julia Hannon Lyle
Winfield Tucker, in memory of Joseph, Isabelle
and Adeline (3 Beds)
J. Spencer Turner, in memory of his first wife,
Cornelia J. Turner
- 1910 Jane A. Townsend, in memory of her son,
Randolph W. Townsend, Jr.
Jane A. Townsend, in memory of her son,
Harmon W. Norton
Jane A. Townsend, in memory of her daughter,
Emma L. Norton
Amelia Mott Graham, in memory of
Malcolm Graham
Adeline Ives Latham, in memory of her husband,
John Howard Latham
Estate of Josephine G. Lord, in memory of her
husband, Franklin B. Lord
- 1911 Brearley School Girls and others interested, in
memory of Madam Bertha Beck, the
"Madam Beck Memorial Teacher's Bed"
Harriet Coles, in memory of her sisters,
Susan and Anna Codman
Caroline Thorn Kissel, in memory of her husband,
Gustav Edward Kissel
- Katherine Spencer Leavitt, in memory of her
husband, Rev. William Leavitt (2 Beds)
Reformed Low Dutch Church of Harlem
Frederick Sturges, in memory of his father,
Jonathan Sturges
William Stewart Tod, in memory of his brother,
George Tod
- 1912 Melville de Wolf, in the Children's Ward,
the "Emma de Wolf Bed"
Gustavia A. Senff, in memory of her husband,
Charles A. Senff
Mrs. Christopher M. Bell, "The Dennistoun Bed"
- 1913 Cornelia Eaton, to be known as "The Dr. Reuben
S. Carpenter Memorial" (3 Beds)
Mrs. Jeremiah V. Meserole, in memory of her son,
Abraham Meserole
Josephine Penfold
Jane G. Phelps, in memory of her husband,
Anson G. Phelps, Jr. (2 Beds)
- 1914 Hugh D. Auchincloss, in memory of his mother,
Elizabeth Auchincloss
Jane Elizabeth Grannis, in memory of her mother,
"Charlotte Williams Platt Bed"
William H. Penfold, in memory of
Josephine Penfold
Louise Tillinghast, in memory of her sister,
Amelia C. Babcock
Estate of Minnie Hackett Trowbridge (5 Beds)
- 1915 A Friend, in memory of Sophia Kellogg Stebbins
and Mary Tompkins Kimball
A Friend
Mrs. Jeremiah V. Meserole, in memory of her
father-in-law, Abraham Meserole
Mrs. Jeremiah V. Meserole, in memory of her
husband, Jeremiah Vanderbilt Meserole
Mrs. Jeremiah V. Meserole, in memory of her
brother, Adolphus Clock
Mrs. Jeremiah V. Meserole, in memory of her
parents, Alfred and Anna Maria Clock
- 1916 Emil C. Bondy, in memory of
Margaret Carson Cowan
Central Presbyterian Church
Mr. and Mrs. James Petrie Chalmers, in memory
of James Petrie Chalmers, Jr., "The Chalmers
Memorial Bed"
Robert A. Chambers, in memory of his father,
Robert Chambers
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
William D. Sloane (3 Beds)
- 1917 Emeline Y. Danforth, in memory of
Mrs. William B. Jenkins
Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
Estate of Sarah C. Miller
Albert Winter, in memory of
Adaline Benson Winter
- 1918 Ida Leora Olmstead, to be known as the
"Leora McCammon Bed"
- 1919 Samuel Elliott
Elizabeth Keys, in memory of her daughter,
Edith Keys
Rutgers Presbyterian Church

- Estate of James R. Steers, in memory of his former wife, Rebecca E. Steers
Estate of John W. Sterling
- 1920 William C. Boschen, to be known as the "Boschen Bed"
Rosa Franklin (4 Beds)
Francis P. Furnald
Mrs. Francis P. Furnald
Mary A. Harriot, to be known as the "Margaret Harriot Alms"
Mary A. Harriot, to be known as the "James Harriot Alms"
Mrs. Henry O. Havemeyer, in memory of her parents, George William and Matilda Adelaide Elder
Estate of Margaret J. Orr, in memory of her mother, Ann Boyd Orr
Anna St. John, in memory of her brother, Milton St. John
- 1921 Mrs. Peter B. Wyckoff, to be known as the "Sidney Dillon Bed"
Henry M. Gescheidt
Ralph E. Prime, in memory of his daughter, Ruth Havens Prime
Joseph K. Gwynn
Charles S. Ward, in memory of his friend, Sophie L. Kinman
Charles S. Ward
- 1922 Minetta C. Howenstine (8 Beds)
Christina C. Munro, in memory of her husband, John Munro
Anna M. Romaine, in memory of Dr. William I. Detmold
Estate of Arnold Thayer (2 Beds)
Hamilton B. Tompkins, in memory of his wife and himself
- 1923 Lydia Augusta Brown
Josephine Newman Hall
- 1924 Bohemian Society "Lidumil"
Cordelia F. Turrell
Nannie Gyles Johnson, (Children's Ward), in memory of her son, Shirley Everton Johnson
Mrs. William John Fitzgerald
- 1925 Christina Bond, in memory of Julia C. Skidmore
George Clarke
Estate of Elizabeth J. Hofer, in memory of Catherine Parke and Horatio C. Kretschmar (2 Beds)
Edward M. Morgan Memorial Association, in memory of Edward M. Morgan (4 Beds)
Jennette Robertson, to be known as the "Helen C. Inslee Endowed Bed"
- 1926 Elizabeth Ellen Auchincloss, to be known as the "E. E. Auchincloss, Jr. Bed"
Members of the New York Stock Exchange, to be known as the "Seymour LeGrande Cromwell Memorial" (2 Beds)
Edmund Penfold, in memory of Josephine Penfold and William Hall Penfold (2 Beds)
Dr. and Mrs. M. Allen Starr, in memory of Allen Egbert Starr
- John B. Trevor, in memory of Emily N. Trevor
George D. Widener
- 1927 The Second Presbyterian Church in the City of New York
Ellen Mills Borne, in the Children's Ward, to be known as the "John E. Borne Bed" and the "Nellie M. Borne Bed" (2 Beds)
Virginia Marquand Monroe, in the name of the Young Men's Christian Association
Mrs. Charles H. Senff, to be known as the "Dr. George A. Tuttle Bed"
W. Frazer Gibson, in memory of his mother, Jeanette Frazer Gibson, to be known as the "Jeanette Frazer Gibson Bed"
Augustus C. Gurnee, in memory of his mother, Mary M. Gurnee (2 Beds)
Eliza V. Nicholson
Mrs. Murray W. Dodge and Mrs. Franklin Lord, in memory of their mother, Mrs. Fordyce D. Barker (Single Ward Room)
Dunlevy Milbank (Single Ward Room)
F. Ethel Wickham, in memory of her father, William Hull Wickham, to be known as the "William Hull Wickham Bed" (Single Ward Room)
Anna A. Johnston, in memory of her parents, William G. and Adriana C. Gardner
Anna A. Johnston, in memory of Lewis, Anna, Edward and Mary Johnston (Single Ward Room)
Broadway Presbyterian Church, to be known as the "Walter Duncan Buchanan Bed"
- 1928 North Presbyterian Church
In memory of McKevers Bayard Brown (Single Ward Room)
Caroline B. Sellow (4 Beds)
The Red Cross Rooms for Nurses (3 Single Ward Rooms)
Robert W. deForest (Single Ward Room)
Henry W. deForest (Single Ward Room)
James R. Steers
Jane Livingston Armour, in memory of John A. Livingston
Jane Livingston Armour, in memory of Herman O. Armour
In memory of Meredith Howland Pyne
Stella C. and Roi C. Megrue (Single Ward Room)
Mrs. E. C. Wills, in memory of her mother, Mrs. J. F. Ackerman, and her sister, Mrs. W. Clarence Reed
- 1929 Caroline White, in memory of her sister, Eliza W. White
Elizabeth A. Hays, in memory of William and Charlotta Hays
- 1930 Mr. and Mrs. Ernest Trow Carter
The Presbyterian Church in the Town of Rye, New York
Mrs. Arthur E. Lauderback, in memory of her mother and father, Esther Hull Jackson and Peter A. H. Jackson
Mary L. Walker Peters, to be known as "The Charles Grenville Peters and Mary Walker Peters Free Bed"

- Marie F. Coddington, to be known as
"The Emilie Coddington Bed"
- 1931 Mrs. Clara Beales Obrig, in memory of
Adolph Obrig and Clara Beales Obrig
(Single Ward Room)
Alfred V. Meserole, in memory of his mother,
Evelina A. Meserole
- 1932 In loving memory of Justine Adele Stafford
(Mrs. W. F. Stafford) by her sister,
Ida Evelina Bliss
- 1933 Mrs. John A. Hance and Mrs. Irene Louise Hance,
in memory of James R. Jesup
- 1934 Ida Adams, in memory of her sister, Sadie E. and
her brother, Robert F. Adams (Single Ward
Room)
Josephine Leypoldt, in memory of her brothers,
Louis and Frederick Leypoldt (2 Beds)
- 1935 Walter J. M. Donovan, in memory of his father,
Timothy Donovan
- 1936 Elizabeth P. Hewes, to be known as
"The Elizabeth P. Hewes Bed"
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
Mary S. Thayer, to be known as
"The Orlando Thayer Bed"
- 1937 Margaretta J. Gamble, to be known as
"The Gamble Bed," in memory of her
father and mother
Jeremiah Milbank, in memory of his father,
Joseph Milbank
- 1938 Susetta L. Goss, to be known as "The Goss Bed,"
in memory of her parents, Rev. C. C. Goss and
Theodosia C. Goss
Annie Miller, to be known as "The Mrs. Alexander
Miller Memorial Bed," in memory of her
mother, Mrs. Alexander Miller
Bertha H. Minturn, in memory of her most
faithful and beloved nurse, Mary Humphries
Henry T. Sloane, to be known as "The Euphemia
Sloane Coffin Bed," in memory of his sister,
Euphemia Sloane Coffin
- 1939 "In Memoriam"
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- 1940 George Gibbs, to be known as "The George
Gibbs Bed"
- 1942 Mrs. Huntington McLane, to be known as the
"Therese K. Thorne Bed," in memory of her
mother
Cornelia Livingston Pell, in memory of
Alfred Duane Pell
Frank Wallach, in memory of Ida May Wallach
- 1943 Stuart Duncan, to be known as
"The Stuart Duncan Bed"
- 1944 Anonymous, to be known as "The Dr. William
Darrach Bed"
John Fraser, in memory of his parents,
Alexander and Elizabeth Fraser
- 1945 Robert W. Carle, in memory of his mother,
to be known as the "Cornelia Willets Carle Bed"
for general hospital use including harelip and
cleft palate cases
- 1947 W. and J. Sloane
Frederick Sturges, Jr., Mrs. Mary Armit Sturges,
Mrs. Catharine Armit Chapman and Frederick
Sturges, III, in memory of Frederick Sturges
Walter S. Gifford, in memory of his son,
Walter Sherman Gifford, Jr.
Ida L. Darling, to be known as the
"Richards Memorial Bed"
John Sloane, in memory of his wife, Elsie Nicoll
Sloane, to be known as the "Elsie Nicoll
Sloane Bed"
Elisa Smith Mabon, in memory of her husband,
James Brown Mabon
- 1948 Otto M. Eidlitz, to be known as the "Eidlitz Bed"
- 1949 Effie B. Sheaman
- 1951 Gerrish Hill Milliken
- 1952 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
- 1953 Estate of Charlotte C. Garretson, to be known as
the "Charlotte Higbee Kelsey Bed"
W. Alton Jones Foundation, Inc., to be known as
the "Nettie Marie Jones Bed"
- 1954 Estate of M. Samuel Stern, to be known as the
"M. Samuel Stern Memorial"
- 1955 Estate of Robert J. Eidlitz, to be known as the
"Marc Eidlitz Bed"
Mrs. John S. Holbrook, in memory of her parents,
John Johnston and Mary Sloane Sinclair
- 1956 Estate of Aurie Dell Black, to be known as the
"Aurie Dell Black Bed"
Robert W. Carle, to be known as the
"Adele Skiddy Carle Bed"
Estate of Adolph Riesenberg, to be known as
"The Adolph and Anna A. Riesenberg Bed"
- 1957 George F. Cahill, M.D., to be known as the
"Endowed Bed for Personnel of the Squier
Urological Clinic"
Edward H. Carle, in memory of his father, to be
known as the "John J. Carle Bed"
Mrs. William J. Demorest, in memory of her
parents, Wealthy H. Lewis and
Richard James Lewis
Chancellor Kent Lodge 870, Free and Accepted
Masons, in memory of George J. Weissman
Morris Morgenstern Foundation, to be known as
the "Sadie B. Morgenstern Bed"
Estate of Mary Ross Potter, to be known as the
"Georgianna Morley Bed"
Estate of Mathilde S. Sterne, to be known as the
"Simon Sterne Beds" (4 Beds)
Board of Trustees of The Presbyterian Hospital,
in honor of and to be known as the "Charles P.
Cooper Endowed Bed"
- 1958 Mrs. Robert W. Carle, to be known as the
"Robert W. Carle Bed"
- 1959 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
Mrs. Stanley G. Mortimer, to be known as the
"Stanley G. Mortimer Bed," in memory of her
husband
Mrs. John S. Thacher, to be known as the "Frances
E. Baker Bed," in memory of her mother

- 1960 Estate of Exerene L. Flood, to be known as the "Dr. George Ballery Flood Endowed Bed"
Minister, Elders and Deacons of The Collegiate Reformed Protestant Dutch Church of The City of New York, to be known as "The May A. Ingenthron Memorial Bed"
Estate of James Miller, to be known as the "A. Miller Endowed Bed"
Estate of Joan D. Sanger, to be known as the "Bertram J. Sanger Endowed Beds" (2 Beds)
- 1961 Estate of Ellen Clarke Bertrand, to be known as the "Ellen Clarke Bertrand Memorial Endowed Bed"
Mr. and Mrs. Samuel W. Meek, in memory of Michael Jeremy Meek
- 1962 Mrs. William J. Demorest, to be known as the "Howard W. Albro Memorial Endowed Bed"
Estate of Henrietta S. Wolf, to be known as the "Julia Wolf Endowed Bed"
- 1963 George S. Walden, in loving memory of Mrs. Julia E. Carroll
- 1965 Estate of Mildred E. Sterry, in memory of her mother, Katherine Landers; her brother John J. Landers and herself (4 Beds)
- 1966 Estate of Agnes Irvine, in the name and memory of Daniel Elmer Salmon (6 Beds)
Estate of Florence R. Paul, in memory of her mother, Kathryn Wilson Roberge (5 Beds)
Estate of Florence R. Paul, in memory of her brother, Franklin Pierce Roberge
- 1967 Estate of Clarence J. Schmelzel, to be known as the James Henry Schmelzel and Annie Louise Schmelzel Endowed Beds. (12 Beds)
- 1968 Estate of Catherine Ridley, in memory of her mother, Catherine Ridley, and her father, Arthur J. Ridley (5 Beds)
- 1969 Estate of Catherine Ridley, in memory of her mother, Catherine Ridley, and her father, Arthur J. Ridley (7 Beds)
- 1970 Estate of John W. Hornor, to be known as the John W. Hornor Endowed Beds (2 beds)
- 1970 Estate of Florence R. Paul, in memory of her mother, Kathryn Wilson Roberge (4 beds)

Memorial Endowed Beds for Research Purposes

- 1948 Mrs. William Barclay Parsons, in memory of her husband, General William Barclay Parsons
Muriel Jane Rudinger Foundation, Inc., to be known as the "Muriel Jane Rudinger Bed"
- 1950 Charles E. Culpeper Foundation, Inc. (2 Beds)
- 1952 John F. Bush Memorial Bed
Estate of Selma Boyd, each to be known as a "Boyd Bed" (2 Beds)
Bruce Barton, in memory of his wife, to be known as the "Esther Randall Barton Memorial Bed"
- 1953 Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
W. Alton Jones Foundation, Inc., in memory of Mamie W. Marvin
- 1954 Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's father, Dr. Charles Lathrop Parsons
"John Shepard Parke Memorial Bed"
Mr. and Mrs. Sidney J. Weinberg, in memory of their parents
- 1955 Bruce Barton, in memory of Clyde Scott and Helen Barton Stilwell, to be known as the "Clyde Scott and Helen Barton Stilwell Memorial Bed"
George F. Cahill, M.D., Research Bed in the Department of Urology
Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's mother, Mrs. Charles Lathrop Parsons
Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
Williams-Adler Foundation Bed
- 1959 "John Shepard Parke Memorial Bed"

Endowed Rooms

- 1903 Henry H. Rogers, to be known as "Room J"
- 1905 Mrs. Morris K. Jesup, to be known as the "Eliza de Witt Memorial Room"
- 1910 Mrs. John Stewart Kennedy, in memory of her husband, to be known as the "J. S. K. Memorial Room"
- 1912 Peter Cumming, to be known as "The Peter Cumming Memorial Room"
- 1926 Alumnae Association of the School of Nursing of The Presbyterian Hospital, to be known as the "Amabel S. Roberts Memorial Room"
- 1928 Mrs. William Sloane, to be known as "The William Sloane Room for Graduate Nurses"
- 1930 The Sarah A. Hard Taylor Memorial Fund, to be known as "The Sarah A. Hard Taylor Room"
- 1935 Mrs. Herbert Neal, in memory of her first husband James Norman Hill
- 1937 S. Augusta Mora, in memory of her husband, Frank Mora and mother, Sarah Robson Van de Water
- 1946 Estate of Caroline Catherine Cary, to be known as the "Caroline Catherine Cary Endowed Room"
- 1960 Mr. and Mrs. Robert W. Carle, to be known as "The Robert W. and Adele S. Carle Endowed Room"
Estate of Bertha C. Miller, to be known as the "James Miller Endowed Room"
- 1961 Estate of Sarah Louise Johnston, to be known as the "Andrew Johnston Memorial Room"
- 1962 The Dr. Thomas W. Stevenson Memorial Fund, a semi-private room to be known as "The Dr. Thomas W. Stevenson Memorial Endowed Room"
- 1963 Estate of Adele S. Carle, to be known as the "Robert W. Carle Rooms" (7 Rooms)

- 964 Mr. John S. Thacher, in memory of his mother,
Frances Lake Thacher
- 965 Estate of Jennie Hankinson Sinclair, two rooms to
be known as "The Francis MacDonald Sinclair
Endowed Room," and "The Jennie Hankinson
Sinclair Endowed Room"
- 970 Estate of Constance G. Gross in memory of
Constance G. and Gustave Gross

Babies Hospital

- 892 The Cribside Committee, to be known as
"Cradyl-Nyst"
- 894 Miss Ellen James Evans
Henry Stewart Trevor, by Mrs. Henry G. Trevor
- 895 Mrs. Evan T. Walker
Mrs. Richard Arnold, in memory of
Georgiana Arnold
- 1896 Mr. and Mrs. Charles M. Fry, to be known as the
"Mr. and Mrs. Charles M. Fry Bed"
- 1897 Mrs. George Kemp, for the use and purposes of
the Hospital
- 1898 Mrs. Oliver G. Jennings, to be known as the
"Brewster Bed"
- 1899 Mr. and Mrs. John Sherman Hoyt, in memory of
John Sherman Hoyt, Jr.
- 1900 Mrs. Elizabeth Chamberlin Lockwood, in memory
of Emily Beaver Chamberlin
- 902 Mr. and Mrs. William E. Dodge, in memory of
their granddaughter, Grace Osborn
Henry P. Wertheim, in memory of
Clara W. Wertheim
- 1904 Mr. and Mrs. George Arents, in memory of
George Arents Brown
Estate of Mrs. Charles Harvey Hartman
- 1905 Mrs. J. Henry Lane
Mrs. Daniel S. Lamont, to be known as the
"Julia Lamont Bed"
- 1907 The Cribside Committee
- 1908 Arthur W. Butler, in memory of
Elizabeth Marshall Butler
- 1910 Dr. and Mrs. L. Emmett Holt, in memory of
Kenneth M. Holt
Edwin Clarence Moller, in memory of his father,
Peter Moller
- 1911 Emily A. Watson, in memory of Wheeler Watson
Mrs. Bradley Martin, in memory of
David Bradley Martin
- 1912 In loving memory of J. Bradley Cumings, endowed
by his friends. "Greater love hath no man than
this, that a man lay down his life for his friends."
— *St. John 15:13*
- 1914 Mrs. Andrew Carnegie, in memory of
Archibald Fraser Barrow
Estate of Mrs. Robert W. Todd, to be known as
"The Mabel Todd Bed"
- 1916 Mr. and Mrs. John Chandler Moore, in memory
of Edward de Bébian Moore, the
"Edward de Bébian Moore Bed"

- Mrs. John Hubbard, in memory of
Margaret Fahnestock
- Mrs. Clarencé M. Hyde, to be known as the
"Clara Mathewson Hyde Bed"
- 1917 Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
- Mrs. Edward S. Harkness, to be known as the
"Thomas Stillman Taylor Bed"
- Mr. and Mrs. Walter A. Hirsch, in memory of
John Walter Hirsch
- 1919 Mr. and Mrs. Daniel Schnakenberg, in memory of
their daughter, Anna Kate Bartlett
Mrs. John Jay Knox, in memory of John Jay Knox
Mrs. John Jay Knox, in memory of
Dr. Reuel B. Kimball
- 1920 Mrs. Andrew Carnegie, a thanks offering for
Louise Carnegie Miller
- 1921 Estate of Jacob H. Schiff
- 1922 The Cribside Committee, in memory of
Sarah Elizabeth Williams
Mr. and Mrs. Simon Guggenheim, in memory of
their son, John S. Guggenheim
- 1923 Mr. and Mrs. Herman Armour Nichols, in loving
memory of Marie Louise Nichols
- 1929 Estate of Julia M. Stout
- 1930 Estate of Edith Crosby Thomson, in memory of
her mother, Mrs. Grace H. Thompson
- 1934 West End Collegiate Church
- 1935 Estate of Daniel Schnakenberg, in memory of his
children, Daniel Schnakenberg, Jr. and
Marie Schnakenberg
- 1936 Estate of Carrie Guggenheim
- 1938 Estate of Emily S. Hornblower, in memory of her
stepdaughter, Susie Sanford Hornblower, the
"Susie Sanford Hornblower Bed"
- 1949 Dr. Frederic H. Bartlett. Endowed in loving mem-
ory of Frederic H. Bartlett, M.D., 1872-1948, by
his patients and other friends, to commemorate
his many years of faithful service in Babies
Hospital
- 1950 Estate of Emelyn L. Coolidge, in memory of
Marianna Wheeler and Emelyn L. Coolidge,
M.D., to be known as "The Wheeler-Coolidge
Bed"
- Estate of Isabel Shields Kemp, to be known as the
"Mary M. Shields and the Dr. Robert Coleman
Kemp Free Bed"
- 1957 Estate of Martha S. Reynolds, in memory of her
mother, Ernestine Schaffner
- 1962 Estate of Caroline D. Hewitt, to be known as the
"Caroline Danella Hewitt Endowed Bed"
- 1964 Mr. and Mrs. Samuel Rogovin, in honor of their
parents, Mr. and Mrs. Louis Rogovin and
Mr. and Mrs. Bernard R. Simon

Neurological Institute

- 1929 The Red Cross Endowed Room for Nurses
Rivington-Dwyer Endowed Room for Nurses
- 1943 Alice Dunning Starr, in memory of her husband,
Allen Starr
- 1959 Jack J. Dreyfus, Jr., in honor of his father, the
"Jack J. Dreyfus, Sr. Bed"
- 1967 "In Memory of Mrs. Sidney J. Weinberg, donated
by her husband and Family."
"In Memory of Helen Livingston Weinberg (Mrs.
Sidney J. Weinberg) from funds donated by her
friends and those of the Family."

**Memorial Endowed Beds
for Research Purposes**

- 1952 Estate of John H. Bahrenburg, in memory of
John H. Bahrenburg and Elizabeth Bahrenburg
(16 Beds)

New York Orthopaedic Hospital

- 1883 Miss C. B. Hicks, continued in perpetuity by
Buchanan Winthrop
- 1886 Mrs. Elizabeth Milbank Anderson, in memory of
J. Milbank Anderson (4 Beds)
- 1891 Alfred Corning Clark (3 Beds)
Edward Severin Clark, to be known as the
"Edward Severin Clark Beds" (2 Beds)
Mrs. Henry S. Winthrop
- 1893 Mrs. William D. Sloane, in memory of
William Douglas Sloane, Jr.
James K. Gracie, in memory of
Anna Bulloch Gracie
Miss Sarah B. Gibbs
- 1894 Mrs. Richard Tylden Auchmuty, in memory of
Richard Tylden Auchmuty (2 Beds)
James H. Jones
- 1896 Mrs. William Astor, in memory of
Helen Roosevelt
Mrs. Evan T. Walker, in memory of
John J. Walker
- 1897 Mrs. William D. Sloane, one bed in memory of
Maria Louise Vanderbilt and one in memory of
Emilie Vanderbilt Burden
- 1898 Mrs. Charles B. Alexander, for her daughter,
named the "Harriet Alexander Bed"
- 1901 Mrs. N. A. Baldwin, in memory of
Louise Suydam Duer
Mrs. Benjamin Brewster, in memory of
Benjamin Brewster
Jessie and Emily Sloane Bed, endowed by their
father, Henry T. Sloane
Mrs. Marion Story, in memory of
M. Furman Hunt
- 1902 James Henry Smith, in memory of
George Smith (2 Beds)
Miss Emily A. Watson, in memory of
Mrs. Mary J. Walker

- 1904 Miss Cornelia Prime, in memory of her brother,
Temple L. Prime
Miss Helen Phipps
James K. Gracie, in memory of
Esther Gracie Ogden
- 1906 Miss Caroline White
Mrs. M. Dwight Collier, in memory of
Maurice Dwight Collier
- 1908 Mrs. H. N. Munn, Mrs. Augusta Munn Tilney and
Orson D. Munn, in memory of
Henry Norcross Munn
- 1911 Estate of Everetta C. Whitney
Miss Josephine C. Smith, in memory of her father,
Dr. Edward A. Smith, and her mother,
Rebecca Miller Smith
- 1913 Estate of Marion de Forest Clark, in memory of
Julian Bouton Clark
An anonymous donor, to be known as the
"Mary Townsend Cuyler Bed"
Caroline F. Butterfield, in memory of
Frederick Falconer Butterfield
- 1915 Miss Emily Trevor
Mrs. Frederick W. Vanderbilt, to be known as
"The Louise Bed"
George Grant Mason, in memory of his uncle,
James Henry Smith (2 Beds)
- 1916 Henry M. Tilford, in memory of
Catharine Hunt Tilford
Estate of Clementine Furniss, to be known
as the "Clementine Furniss Bed"
An anonymous donor
- 1917 Mrs. Charles H. Senff, in memory of her little son,
Henry Senff
Mrs. A. Murray Young, in memory of her
great uncle, Wilson G. Hunt
- 1919 R. Fulton Cutting, to be known as the
"Helen Suydam Cutting Bed"
Mrs. Frederick Delano Hitch
Levi P. Morton, in memory of
Anna Livingston Morton
Miss Georgiana G. R. Wendel, in memory of her
sister, Augusta A. S. Wendel (2 Beds)
Various donors, in memory of
Theodore Roosevelt
- 1920 Mrs. John Hobart Warren
- 1921 Mrs. Winthrop W. Aldrich, in memory of her
little son, Winthrop Williams Aldrich, Jr.
F. Ambrose Clark, to be known as
"The Florence L. Clark Bed"
- 1922 Mrs. David T. Dana, in memory of her mother,
Mrs. M. Dwight Collier
- 1924 Estate of Charlotte Bruce Bickmore, in memory
of Albert Smith Bickmore, Jr.
Estate of Louise Ward McAllister Lewis,
in memory of her mother, Sarah T. McAllister,
to be known as "The Sarah T. McAllister Bed"
- 1925 Estate of Elizabeth J. Hofer, in memory of
Horatio C. Kretschmar (2 Beds)
Percy Chubb, in memory of his wife

Junior Red Cross of the Public Schools of
the City of New York

Mrs. Douglas Robinson, in memory of her friend,
Charles Allen Munn

1926 Junior Red Cross of the Public Schools of
the City of New York

1927 Darrach Home for Crippled Children, in memory
of Dr. May Darrach

1928 Mrs. Mary L. Schoonmaker, in memory of
Sylvanus Lothrop Schoonmaker and
Frank Layng Schoonmaker (10 Beds)

Estate of Henry D. Dickinson, in memory of
Hathaway M. Dickinson

1930 James T. and Sarah Bancroft Leavitt, to be known
as the "Mrs. James T. Leavitt Bed"

1934 Henry C. deRham, Frederic F. deRham and
Clarisse deRham Rutherford, in memory of
their parents, Charles and Emily Howe deRham

1935 Mrs. Percy R. Pyne and family, in memory of
Meredith Howland Pyne

1936 Miss Elizabeth Stewart Hamilton, in memory of
Mrs. John Hobart Warren, to be known as
the "Harriette Mott Warren Bed"

Mrs. Edward S. Harkness, to be known as the
"Dorcas House Bed" in dear memory of
Wilma Gideon

1938 Miss Grace Howard Potter, to be known as the
"Howard and Mary Louisa Potter Bed,"
in memory of her father and mother

1955 General and Mrs. E. F. Maude, in memory of
Mrs. Maude's father, Robert S. Brewster
Estate of Carrie Rosenshine, to be known as
"The Lillie Rosenshine-Marjorie L. Kaufman
Bed"

1956 Estate of Adolph Riesenbergs, to be known as
"The Adolph and Anna A. Riesenbergs Bed"

1967 Estate of Elliot W. Lawrance, in memory of
Clifford Lawrence King.

1967 Estate of Elliot W. Lawrance, in memory of
Mrs. Thelma Mary Lawrance.

Endowed Rooms

1922 Glenn Ford McKinney, a ward room in the
country branch, in memory of his wife,
Jean Webster McKinney

1929 400 of his friends and associates, a room in the
private pavilion, in memory of H. Le Roy von
Lackum, M.D., surgeon in this hospital,
1916-1928

1967 Mrs. Anna I. Feldman, a semi-private room, in
memory of her husband, to be known as the
Anna I. Feldman Room, in loving memory of
her husband, Irving J. Feldman.

Institute of Ophthalmology

(Including Herman Knapp Memorial Eye Hospital)

1883 Mrs. Oswald Ottendorfer

1884 Miss Henrietta A. Lenox

1895 Miss Mary Morris van den Heuval

1897 Mrs. Giovanni Ceccarini

1913 Miss Catherine A. Bliss
Miss D. Willis James

1918 Truman Peck Stone

1921 Miss Rosie Bernheimer, in memory of her parents

1923 Miss Mary Wiley, in memory of her brother,
George Wiley

1928 Mrs. Matilda Townsend Palmer

1931 Lee Doblin

1936 Charles M. Brooks

1957 The Mortimer and Harriet M. Marcus Foundation,
Inc., to be known as "The Mortimer and
Harriet M. Marcus Endowed Bed"

1964 Estate of Thomas W. Byrnes, in memory of his
wife, Minnie Marcey Jarboe Byrnes

Endowed Bed for Research Purposes

1965 Malcolm P. Aldrich, to be known as the
"Malcolm P. Aldrich Endowed Research Bed"

Index to Professional and Academic Staffs

	PAGE		PAGE		PAGE
Abadir, Nelly F.....	254	Anderson, Helen M.....	256, 277	Baker, Alice T.....	256
Abadir, Sami A.....	254	Anderson, Julien W.....	271, 299	Baker, Jr., Daniel C.	
Abbatello, Vincent J.....	299	Anderson, Thomas L.....	261	242, 243, 259, 268, 269, 283	
Abbott, Richard E.....	286	Andreae, Eric	279	Baker, David H.....	263, 268, 291
Abdullah, Syed	287	Andree, Ronald A.....	275	Baker, John D.....	257
Abell, Liese L.....	275, 277	Andresen, Richard A.....	281	Baker, Katherine J.....	277
Abelson, David C.....	300	Andrews, David L.....	259, 268, 282	Baker, Vernon G.....	278
Abelson, Jacob	300	Andrews, George C.....	254	Balinson, Norman V.....	288
Abrahams, Irving	255, 276	Ans, Roy P.....	258	Balis, Eugene A.....	257
Abrams, Cyril A. L.....	260, 285	Ansanelli, Jr., Vincent W..	264, 293	Balkoura, Athanasia	262, 287
Abramson, David	259	Anstendig, Howard S.....	299	Ballard, Lowyd W.R.....	293
Abren, Louis M.....	294	Antar, Robert	261	Ballard, Andre B.....	262, 286
Abu Nassar, Solange G.....	284	Antunes, Joao L.....	257	Ballard, Bruce L.....	288
Adamec, Kenneth	290	Appel, Gerald B.....	257	Ballard, Harold S.....	278
Adams, George H.....	290	Applebaum, Edmund	274, 299	Balsam, Dvorak	263
Adams, Jr., John F.....	259	Appleby, Robert E.....	261, 284	Balser, Benjamin H.....	262, 288
Adams, Mary	261	Applewhite, Harold L.....	271, 272, 298	Balteanu, Cornelia	261
Adels, Nancy J.....	280	April, Ernest W.....	270, 274	Bank, Arthur	255, 277
Adelson, Jerry J.....	299	Aranow, Jr., Henry.....	255, 277	Bannerman, Alfred C.....	280
Adinolfi, Matteo C.....	294	Arce, A. Anthony.....	288	Banogon, Petra E. P.....	284
Adlersberg, Mella	275	Arm, Stuart B.....	258	Barach, Alvan L.....	254
Adsit, Charles G.....	279	Armstrong, Jeanne	291	Baral, William C.....	300
Agate, Frederic J.....	274	Aronoff, Michael S.....	262	Barbee, William R.....	255, 276
Ain, Brent R.....	264	Asch, Thane	263, 291	Bard, Richard H.....	265
Akhter, Jeanette E.....	258	Aseme, Kate N.....	264	Barden, Herbert	284
Albert, Harry D.....	262, 287	Ash, Rosemary L.....	280	Bargren, John H.....	259
Aldin, Peter	287	Ashford, Thomas P.....	293	Barker, Doris	280
Alexander, George	275, 286	Ashley, Charles A.....	268, 284	Barker, Harold G.....	243, 263, 292
Alexander, H. Clay.....	293	Askenasy, Alexander R.....	287	Barker, Leslie P.....	254, 275
Alexander, Jack T.....	286	Asnes, Russell S.....	260, 265, 268, 284	Barkhuus, Arne C. V.....	288
Alexander, Stewart F.....	256, 277	Ast, David B.....	290	Barns, Douglas H.....	281
Allard, Gilles	283	Atchley, Dana W.....	242, 254, 274	Barnum, Howard J.....	256, 277
Allderdice, Penelope W.....	281	Atchley, John A.....	262, 287	Baron, Michael	299
Allen, Gail B.....	288	Athos, William P.....	279	Barone, Mary R.....	280
Allen, Lucretia	283	Atkin, M. David.....	285	Barrett, C. Redington	279
Allendorf, Dennis	261	Attia, Albert	278	Barrett, Robert E.....	258, 280
Alling, Frederic A.....	287	Atwal, Jasjit B.....	254	Bartalos, Mehaly	276
Almenoff, Irwin A.....	283	Atwood, Kimball C.....	268, 276	Bartelstone, Herbert J.....	271, 285
Alpert, Elmer	278	Atwood, William G.....	255, 276	Bartsch, Ernst G.....	258, 281
Alpert, Meyer	291	Aube, Marc	263	Bartwink, Jerome	255, 300
Alston, Casco	256, 277	Aubrey, Rachel	294	Basek, Milos	259, 268, 283
Alsup, Peggy Ann.....	280	Auchincloss, Jr., Hugh....	264, 292	Bass, Stephen C.....	265
Altman, Harry S.....	260	August, Burton	262, 287	Bassett, Arthur L.....	285
Altman, Ina A.....	291	Avella, Arthur N.....	262, 288	Bassett, C. Andrew L.....	259, 282
Altmann, Kenneth A.....	278	Averne, Robert	299	Bassiur, Martin	300
Altschuler, Kenneth Z.....	261, 286	Avery, Charles W.....	262	Batt, Ellen R.....	286
Amarant, Martha L.....	261, 263, 285	Axel, Richard	260	Bathany, Stephen H.....	264
Amberson, J. Burns.....	254, 274	Ayers, Herbert D.....	271, 300	Battista, Joseph V.....	258
Ambinder, Robert L.....	298	Azzoni, Alfred A.....	264, 293	Bauer, Philip J.....	298
Ambrose, George B.....	259, 282			Baum, Gerald	278
Ames, Martin I.....	300	Bachman, Arnold L.....	291	Bauman, Eli	256, 277
Ames, Richard P.....	256, 278	Bachman, Lillian H.....	300	Bauman, Gerald	290
Amcs, Rose G.....	260, 285	Bachner, Paul	284	Bauman, William A.....	260, 284
Amin, Hussein K.....	258, 281	Back, Karen J.....	261	Baumgarten, Jr., Harold	290
Ammann, Margot	281	Badder, Elliott M.....	293	Baumstark, Reynold J.....	299
Amols, William	280	Baden, Ernest	283	Baurmash, Harold D.....	299
An, Teisa	260	Badgley, Robin F.....	290	Baxt, William G.....	257
Anastasiades, Anastasios	285	Baehr, George	290	Beach, Jr., Paul M.....	264, 292
Ancajas, Araceli R.....	285	Baer, Jeanne W.....	291	Beaty, John T.....	256, 277
Anderson, Albert D.....	263, 292	Baer, Leslie P.....	256, 277	Beaulieu, Patricia A.....	280
Anderson, Ethel I.....	282	Bakamjian, Veronica	275	Beck, Gustav J.....	256

	PAGE		PAGE		PAGE
Beck, Leah	262, 286	Beube, Frank E.	271, 299	Boschenstein, Frank K.	258, 280
Becker, Alfred	256, 277	Bhattacharyya, Arun	263	Bose, Jorg	262
Becker, Jr., George L.	279	Bhonslay, Shivaji B.	264, 292	Bossart, Peter A.	293
Beckmann, Albert J.	261, 289	Biavati, Bruce J.	291	Bothner, Paul M.	263
Bedic, Olivera	263	Bickerman, Hylan A.	256, 277	Botros, Samir B.	254
Beekman, Robert S.	279	Bigger, Jr., John T.	255, 277	Boucher, Richard C.	257
Been, Harold	262, 287	Bilchick, Edwin B.	260	Bowe, Edward T.	258, 268, 281
Begg, Charles F.	284	Binkert, A. J.		Bowen, Florry P.	280
Behrens, Myles	259, 282		242, 243, 251, 268, 269, 270, 290	Bowens, Jr., Marx G.	257
Behrman, Richard E.		Bird, Hector R.	262, 288	Bowers, William B.	259
	242, 243, 260, 268, 269, 270, 284	Birkoff, John D.	265	Bowie, Richard R.	258
Bejar, Hugo V.	257	Bissell, LeClaire	278	Boxer, Robert A.	261
Belgraiar, Arnold H.	264	Bito, Laszlo Z.	282	Bowman, Jr., Frederick O.	264, 292
Belinson, Jerome L.	258	Bjorklund, Paul R.	298	Boyajian, Levon Z.	262, 286
Bell, A. Loomis	279	Blabey, Jr., Robert G.	264	Boyd, Alvin T.	298
Bell, Donald C.	262, 287	Black, Dorothy A.	254, 275	Bozidar, Lazarevio	284
Bell, Frank C.	259	Blackman, Robert A.	257	Bradford, Mary E.	261, 285
Bell, Jennifer J.	260, 270, 284	Blackwood, Carlton E.	281	Bradley, Geraldine P.	256, 277
Bell, Robinette N.	262, 287	Blagman, Patricia	280	Bradley, Stanley E.	255, 276
Bell, William B.	285, 291	Blair, Charles E.	257	Bradlow, Paul A.	287
Beller, Alexander	286	Blair, Charles R.	293	Bragg, Everett C.	259, 282
Bellin, Lowell E.	288	Blair, Robert L.	299	Braham, Stanley B.	264, 293
Belmont, Lillian M.	289	Blake, Melvin	283	Brakas, Gunda M.	298
Beltrani, Vincent S.	255	Blanc, William A.	260, 283, 284	Branche, George C.	256, 278
Bemporad, Jules R.	262, 286	Blancato, Louis S.	275	Branche, Matthew D.	293
Bender, Adam	242, 258	Bandy, Lajos	281	Brand, Leonard	254, 265, 275
Bender, Estelle P.	262, 287	Blank, Harold H.	300	Brandt, Philip W.	268, 274
Benedicto, Erlinda	299	Blank, Martin	286	Branwood, A. Whitley	260, 283
Benedito, Milagros	258, 294	Blank, Robert D.	299	Braren, Margery M.	289
Benesch, Reinhold	275	Bleau, Gilles	294	Brasel, Jo Anne	260, 284, 295
Benesch, Ruth E.	275	Blechman, Abraham M.	299	Braun, Carl W.	258, 280
Benfield, James W.	298	Blechman, Martin G.	290	Braun, Norma Mai Tsen Wang	256
Bennett, Courtenay L.	287	Blitz, Allan N.	298	Braun, Norma	278
Bennett, Ruth	287	Blitz, Alma T.	261, 285	Bray, Bonnie A.	277
Bennett, Sidney J.	292	Blood, David K.	257	Bray, Richard C.	275, 282
Bennett, Soja P.	261	Bloom, Robert S.	290	Breakstone, Robert S.	300
Bennett, Stephen L.	262, 287	Bloom, Stanley M.	264, 294	Bredice, Marjorie A.	280
Bennett-Clark, Suzanne	289, 295	Bloomfield, Martin E.	277	Breed, R. Huntington	264
Benninghoff, Daniel W.	283	Blum, Jr., Alexander	261, 285	Brennan, Barbara A.	281
Benoit, Edith B.	281	Blum, Conrad B.	257	Brennan, F. James	285
Benovitch, Andrea J.	281	Blum, Howard I.	298	Brennan, Jr., John T.	293
Benovitch, Harvey	278	Blum, June	287	Brenner, Richard W.	293
Benumof, Jonathan L.	254	Blum, Richard H.	258	Brensilver, Jeffrey M.	257
Berc, Kenneth M.	288	Blume, Ralph S.	256, 277	Brewer, Alfred E.	256, 277
Berdon, Walter E.	263, 291	Blumenfeld, Thomas A.		Brickner, Philip W.	278
Berenberg, Richard A.	258		260, 283, 284	Bridenbaugh, Richard B.	263
Berger, Agnes P.	289	Blumenstock, David A.	293	Bridger, Abraham A.	287
Berger, Milton	286	Blumenthal, Marvin R.	285	Bridges, Jr., Thomas J.	257, 279
Bergmann, Lawrence W.	299	Blumenthal, Richard L.	287	Briggs, John P.	262, 287
Berkman, Alan	257	Bluming, Avrum Z.	257	Brill, Henry	287
Berl, Soll	280	Boelstler, Roy	271, 298	Brill, Paula W.	291
Berlin, Frederick	299	Bogdasarian, Michael	264	Brin, Myron	289, 295
Berman, Stuart A.	298	Bohart, William A.	259	Brisbane, Samuel C.	275
Bernard, Viola W.	254, 288	Bolt, Richard A.	264	Briscoe, Anne M.	278
Bernhard, William	283	Bond, Victor P.	291	Britten, John S.	256, 268, 286
Bernot, Robert	278	Bonner, Jr., Mack	278	Britten, Mary X.	280
Bernstein, Anne E.	262, 287	Bonomo, Gregory	258	Brod, Morton S.	300
Bernstein, Robert S.	279, 295	Boothe, Robert L.	259	Broderick, Cecil B.	279
Berry, Frank B.	274	Borbely, Antal F.	262	Brodey, Marvin	255, 276
Bertles, John F.	256, 278	Bordley, James	264	Broell, John R.	292
Bertrand, Charles A.	278	Borek, Carmine	291	Bronson, Winifred	256
Bertsch, Robert G.	264, 265, 292	Borges, Gelmar	265	Brooks, Mary	281
Besen, Gerald H.	298	Boris, Jacob	261, 285	Brown, Arthur S.	258
Bethke, Emil G.	282	Borsky, Paul N.	290	Brown, Jr., Charles B.	259
		Bosch, Ernesto	258, 294	Brown, David H.	259

	PAGE
Brown, Dennis G.....	258, 280
Brown, Donald E.	283
Brown, Harold W.....	274
Brown, Howard J.....	290
Brown, Jason W.....	258, 280
Brown, Nancy C.....	281
Brown, Roland P.....	289
Brown, Roy H.....	292
Brown, Virginia M.....	289
Brownlee, William H.....	288
Bruce, Gordon M.....	254, 274, 282
Bruck, Harold M.....	264, 292
Bruenn, Howard G.....	254
Bruggeman, Lewis L.....	263
Brunn, Jr., Frederick M.....	259
Brunner, Hans R.....	257, 277
Brunngraber, Elinor F.....	275
Bruno, Leonard A.....	264
Bruno, Sebastian A.....	255, 300
Brunswick, Ann F.....	289
Brush, John M.....	260
Brust, Jr., John C. M.....	258, 280
Brust, Matilda B.....	261, 285
Bruun, Bertel	280
Bryant, John H.....	268, 269, 288
Brzustowicz, Stanislaw H.....	255, 298
Buchanan, John L.....	256, 277
Buchanan, Steven	262
Buckner, John H.....	259
Buda, Joseph A.....	264, 292
Budd, Daniel C.....	264
Budin, Joel A.....	263
Budinger, John M.....	283
Budner, Stanley	289
Budowsky, Jack	255, 300
Buerkle, A. Roy	259
Buhler, Fritz R.....	257, 277
Bull, Marcia B.....	256, 278
Bull, Sherman M.....	264, 293
Bund, Emanuel	289
Bunyaviroch, Sunthorn	281
Bunzel, E. Everett.....	254
Buonanno, Aurelio	287
Burnett, Carol E.....	285
Burris, John O.....	256, 277
Bush, David C.....	259
Bush, Freda C.....	281
Bush, Michael A.....	257
Butler, Jr., Vincent P.....	255, 277
Button, Kenneth	260
Button, Jr., William H.....	278
Butts, Hugh F.....	269, 286
Byrne, John C.....	265
Bysshe, Stanley M.....	258
Cabot, Anthony	264
Cabot, Catherine F.....	257
Cadden, James L.....	288
Caemmerer, Jr., Alex.....	288
Caffey, John	254, 274
Cahn, Lester R.....	255, 274, 284
Cain, Jr., Edward A.....	255, 270, 271, 272, 298
Caldwell, Arline C.....	288

	PAGE
Caldwell, Peter R. B.....	256, 277
Califano, Paul F.....	262, 287
Callahan, Mary E.....	292
Calvin, Harold I.....	276, 294
Camasura, Octavio	254
Cameran, Elliott N.....	291
Cameron, Airlee A. C.....	279
Camesas, Pandelis	298
Camins, Martin	257
Campbell, Charles J.....	259, 282
Campbell, M. Edwina.....	256, 277
Campbell, Milton F.....	259, 282
Campbell, Robert J.....	286
Campbell, William L.....	263, 291
Camunas, Jorge L.....	264
Cancro, James J.....	300
Canfield, Robert E.....	255, 276
Cannaliato, Joseph A.....	285
Cannon, Joe H.....	285
Cannon, Paul J.....	255, 268, 277
Cantor, Herman	299
Cantor, Murray A.....	298
Capriceio, John F.....	300
Carberry, David M.....	293
Carbonara, Peter N.....	259, 283
Carden, Jr., George A.....	255
Cardinale, S. Gerald	298
Cardona, Hernando	282
Carey, Jr., Edward J.....	293
Carey, William B.....	258
Carlson, Robert H.....	257
Carlson, Susan B.....	261
Carluccio, Jr., Charles.....	262, 287
Carmel, Peter W.....	257, 265, 279, 294
Carmical, Neville W.....	260, 283
Carnay, Laurence	258
Caronia, Victor S.....	255, 271, 300
Carpenter, Malcolm B.....	258, 274
Carr, Arthur C.....	286
Carrión, Arturo L.....	276
Carroll, Frank D.....	259, 282
Carroll, Robert E.....	259, 282
Carter, Elizabeth W.....	280
Carter, Rodman D.....	293, 294
Carter, Sidney	257, 279
Casarella, William J.....	263, 293
Casazza, Albert R.....	278
Case, David B.....	257
Case, Robert B.....	256, 278
Cassebaum, William H.....	293
Cassidy, Thomas M.....	287
Castadot, Marie-Jeanne	260
Castronovo, Francesca	280
Catalano, Kathleen F.....	261, 285
Catalano, Louis	258
Cattell, James P.....	261, 286
Caulfield, John P.....	260
Cavallaro, William U.....	259, 282
Cave, Herbert G.....	268, 275
Cederbaum, Alvin D.....	299
Cederquist, John W.....	261, 287
Chabon, Irwin	281
Chabora, Alice J.....	299
Chaitman, Edmund	288

	PAGE
Challenor, Bernard D.....	268, 269, 270, 289
Challenor, Yasoma B.....	263, 292
Challop, Roger	261, 285
Chan, William G.....	254
Chang, Chu Huai.....	242, 263, 268, 291
Chang, Hai Won.....	280
Chao, Solan	242, 258, 281
Chargaff, Erwin	268, 269, 271, 275
Charif, Sonia	287
Charles, Nancy K.....	280
Charney, Jonathan	258
Chasalow, Fred	281
Chattah, Leon	262, 287
Chauhan, Prem	284
Chavis, Pamela	258
Chawla, Santos	260
Chen, Bei-Loo	274
Chen, John	282
Chen, Kwan-Hwa	294
Chen, Tehong T.....	254
Chen, Yueh-Tsun	280
Cherkasky, Martin	290
Chernack, William	261
Cherrick, Gilbert R.....	256, 279
Chiarandini, Irene	288
Chien, Kuang Chung Hu.....	277
Chien, Shu	286
Chilton, Neal W.....	289, 300
Chiou, Ming Chuan.....	255, 275
Cho, Dong Wook.....	263
Cho, Young Sook.....	281
Chodoff, Mark E.....	264
Choe, Woomyung	263
Chong, Claude Yuk-Yeung.....	263, 291
Choy, Daniel S. J.....	256, 277
Christakis, George J.....	290
Christenfeld, Roger M.....	287
Christy, Nicholas P.....	255, 278
Chrzanowski, Paul J.....	256, 277
Chu, Luke S. W.....	263, 292
Chui, David H.....	276
Chuk, Shik-Kei	255
Chusid, Joseph G.....	258, 280
Chutorian, Abe M.....	258, 280, 284
Chynn, Kuo-York	291
Cimino, Joseph A.....	290
Cinberg, James Z.....	260
Cinque, Salvatore G.....	293
Cizek, Louis I.....	286
Clachko, Mark A.....	264
Clark, Noreen C.....	290
Clark, W. Crawford.....	286
Clark, William S.....	278
Cleary, Constance P.....	280
Cleveland, Mather	254
Co, Cayetano C.....	263, 292
Coates, Edward D.....	290
Cobin, Harold P.....	300
Coechiarella, Antonio	263, 292
Coelho, Jaime B.....	277
Coen, Stanley J.....	262, 287
Cohen, Daniel E.....	262
Cohen, Gerald	275, 286

PAGE

PAGE

PAGE

Cohen, Herbert I.....285
Cohen, Max P.....286
Cohen, Michael H.....256, 277
Cohen, Philip257
Cohen, Sidney M.....258, 280
Cohen, Solomon J.....260, 284
Coigney, Rodolphe L.....289
Colcher, Henry256, 277
Cole, James R.....259
Cole, Raymond M.....260, 283
Cole, Robert M.....299
Coleman, D. Jackson.....259, 282
Coleman, Louise286
Colenda, Mary Ann.....261
Collard, Jean E.....277
Collins, Janna C.....261
Colmore, Henry P.....256
Colombotos, John L.....289
Colvett, Robert D.....291
Coman, Alexander281
Conan, Neal J.....256, 277
Conklin, E. Foster.....293
Conley, John J.....259, 283
Connell, Elizabeth B.....258, 281, 294
Connell, John T.....256, 278
Conroy, Richard C.....288
Cook, Diana C.....287
Cook, John A.....261, 286
Cooper, Arnold261, 286
Cooper, Jr., George W.....268, 274
Cooper, Henry S. F.....264
Cooper, Marvin C.....257
Cooper, William C.....259, 282
Copenhaver, Wilfred M.....274
Corbin, Eustace E. S.....293
Corbitt, Theodore292
Correll, James W.....257, 268, 279
Corley, Glenna J.....284
Cormier, Rene E.....278
Cosgriff, Stuart W.....255, 277
Cosla, Horace W.....292
Cosman, Bard264, 292
Coss, Jr., James A.....256, 277
Costa, John L.....261
Costa, Marjorie A.....290
Cote, Lucien J.....258, 280
Cotter, Lawrence H.....256
Cotton, John288
Countee, Roger W.....257
Cournand, Andre F.....254, 274, 278
Cowan, Richard262
Coward, Joe E.....279
Cowburn, David A.....280
Cowan, David260, 279, 283
Coyne, James J.....256, 277
Cozine, Kathryn A. W.....254
Cramer, Fritz J.....254
Crandell, DeWitt.....262, 286
Craneheld, Paul F.....285
Crawford, Mary I.
242, 251, 268, 269, 280
Creque, Luritz C.....284
Crikelair, George F.....243, 263, 292
Cromie, John B.....278

Cropper, Jean B.....290
Crow, John F.....262
Crowley, Robert E.....300
Crumrine, Patricia258
Crupi, Claudio260, 283
Cuatico, William294
Cuckler, Ashton C.....289
Culleton, James F.....258, 280
Cunnick, William R.....278
Cunningham, Allan S.....285
Cunningham, James K.....256, 277
Curnen, Jr., Edward C.....260, 284
Curth, Helen O.....255
Curth, William255
Curtis, Earland288
Curtis, Walter W.....290
Cushman, Paul256, 279
Cuttita, Joseph A.
255, 271, 272, 300
Dadac, Pamela J.....281
D'Adamo, Ann P.....257
Daglian, Kourken A.....255, 299
Dailey, Thomas H.....293
Daines, Joseph G.....264
Daley, John M.....256, 277
Dallas, Donald P.....279
D'Alton, Clarence J.....256, 277
Dalton, Dennis287
Dammann, Gloria L. A.....289
Damrosch, Douglas S.....260, 284
Daniel, Salha S.....275
Daniels, George E.....254
Danziger, Fred300
Darakjian, Raymond Z.....299
Darby, Michele298
D'Arc, Victor288
Darling, Robert C.
242, 243, 263, 268, 269, 291
Darrell, Richard W.....259, 282
Darwin, Harold300
David, David S.....279
Davidson, Charles W.....268, 269
Davidson, David B.....264
Davidson, Henry A.....287
Davidson, Hugh C.....279, 291
Davis, Elizabeth B.....261, 288
Davis, Hillard290
Davis, John288
Davis, John S.....278
Davis, Samuel289
Davis, William J.....260, 284
Daval, Peter B.....262
Day, Robert McC.....259, 268, 282
Dayan, Jean275
Deakins, Susan M.....278
Dean, John van B.....256
deBary, William T.....268, 271
DeBellis, Robert H.....256, 277
deChabon, Ada B.....283
Dedaux, Paul J.....298
Deesen, Kenneth C.....298
Defondini, Richard F.....258, 268, 283
Deglon, Pierre260
DeFries, Zira262, 286

DeHaan, Clayton R.....293
Deitch, Arline D.....279, 283
DeJulia, Joseph A.....300
Delaney, Sylvia A. M.....281
Delaney, William T.....254
DeLeon, Francisco S.....254
De Lisi, Joseph C.....300
Dell, Ralph B.....260, 284
Dellon, Arnold L.....264
Del Rio, Victor Bernal Y.....287
Demarest, Robert J.....274
Demartini, Felix E.....243, 255, 277
Demby, Neal Alan.....298
Dempsey, Edward W.
268, 269, 271, 272, 274
deNapoli, Robert A.....258, 280
Denckla, Martha B.....258, 280
Denning, Carolyn R.
242, 260, 269, 284
Denny, John E.....288
Denton, John R.....259
Derby, Bernice R.....280
Dermksian, George279
deRoethth, Jr., Andrew.....259, 282
Derosena, Roger260
Derosis, Helen A.....288
DeSalvo, Ernest J.....278
DeSanctis, Peter N.....264, 293
DeScipio, Frank J.....290
D'Esopo, D. Anthony.....242, 254, 274
Despommier, Dickinson D.....289
Deutsch, Adelaide A.....292
Deutsch, Ann M.....281
Dev, Vaithilingham G.....276
Devlin, Raymond287
DeVoe, Arthur Gerard
242, 259, 268, 269, 282
Diamond, Leonard287
Diamond, Michael278
Diasio, Karen F. B.....292
Dicello, John F.....291
Dick, Frederick S.....264, 294
Dick, Harold M.....259, 282
Dickinson, Ruth268, 292
Dickinson, Seldin J.....293
Diener, Harry287
Dietrick, William R.....264
Dietzgen, Walter A.....262
Di Giacinto, Robert A.....258
DiGrande, Elaine V.....255, 276
DiJohn, John C.....278
Dillenberg, Stanley M.....258
Dilley, William G.....274
Dillon, Donald280
Dillon, Thomas F.....281
Dilworth, Agnes D.....277
Di Mango, Anthony L.....255, 299
Dimattia, William J.....260
Dinin, Benjamin G.....290
Dintenfass, John I.....262
DiPasquale, Ned260
Di Re, John J.....284
DiSalvo, Nicholas A.
255, 271, 272, 299
Dische, Zacharias274, 276, 282

PAGE	PAGE	PAGE
Dixon, Rosina B.....278	Egan, James H.....288	Feinberg, Arthur .....256, 277
Dobbs, Leland G.....257	Eggers, Howard .....259	Feinberg, Gerald L.....254, 275
Dobson, Chauncey H.....259, 282	Egri, Gladys .....288	Feind, Carl R.....264, 292
Doerr, Iris L.....279	Ehmann, Virginia E.....280	Feiner, Rose R.....279
Dohrenwend, Barbara S.....287	Einbinder, Julia M.....276	Feinerman, Arthur E.....257
Dohrenwend, Bruce P.....286	Eisenberg, Jeanne A.....290	Feinsmith, Burton M.....261, 285
Dolganos, Ellen M.....262, 287	Eisenberg, Max A.....275	Feirstein, Ira D.....262
Domonkos, Anthony N.....255, 276	Eisenstein, T. Donald.....261, 285	Feldman, Bernard R.....261, 285
Donaldson, Kenneth T.....278	Eiser, Harold M.....298	Feldman, Frieda .....263, 291
Donham, Robert T.....254, 275	Eisert, Jack .....255, 276	Feldman, Matthew .....261
Donn, Anthony .....259, 282	Elftman, Herbert O.....274	Feldman, Richard S.....287
Donnelly, Brian.....263	Elinson, Jack.....288	Feliciano, Wilfrido .....264
Donovan, John V.....300	Elliott, Jr., Robert H. E.....251, 254	Felix, Marie D.....274
Donovan, J. Timothy.....264, 293	Ellis, Kent .....263, 268, 291	Fellows, Richard .....263
Donovan, Ruth U.....261, 285	Ellison, G. Alden.....288	Feltman, James A.....279
Donovan, William R.....289	Ellner, Paul D.....257, 268, 279	Felton, Charles P.....278
Donson, Nathaniel .....288	Ellsworth, Robert M.....259, 282	Felton, Hiroko .....281
Dougherty, Jocelyn .....258	Ely, Charles A.....274	Feminella, Jr., John G.....265
Dougherty, Louis J.....264, 293	Emann, Robert E.....290	Fenoglio, Cecilia M.....260
Dow, Lois .....257	Emmers, Raymond .....286	Fenoglio, John J.....260
Downey, John A. ....263, 268, 269, 291	Emy, Robert K.....278	Fenton, Arnold N.....281
Downs, Elinor F.....260, 268, 289, 295	Enderle, Erna S.....256	Fenton, Richard L.....259, 282
Dragon, Leon H.....257	Endicott, Jean .....287	Ferdman, Marvin M.....298
Dresdale, Robert J.....257	Endicott, Noble A.....288	Ferenczy, Alex .....260, 284
Dresdale, Susan S.....261	Enson, Yale .....256, 278	Ferin, Michel .....281, 294
Driscoll, John M.....260, 284	Epstein, Ralph A.....275	Fernandes, Manuel .....294
Driscoll, Yvonne T.....260, 284	Epstein, Robert M.....254, 274	Ferrara, Joseph .....285
Drusin, Ronald .....257	Epstein, Stefan E.....284	Ferrebee, Joseph W.....278
Druss, Richard G.....262, 286	Erganian, Jane A.....261, 285	Ferrer, Jr., Jose M.....264, 293
Duane, Jr., Richard B.....256, 277	Erhardt, Carl L.....289	Ferrer, M. Irené.....255, 277
Ducey, James .....278	Erickson, Dorothy A.....256	Fertig, John W.....263, 288, 295
Duffy, Philip ....260, 268, 279, 283	Erlanger, Bernard F.....279	Fidler, Gail S.....292
Duggan, William P.....258	Erlenmeyer-Kimling, Loise ...286	Fields, Harriet A.....281
Dunn, Albert A.....291	Eryol, Azak S.....284	Fields, James P.....276
Dunn, Jr., Clarence A.....293	Esecover, Harold B.....262, 287	Fields, Martin J.....255, 300
Dunn, Robert N.....259	Esman, Aaron H.....282	Fierer, Joshua .....260, 283
Dunner, David L.....262, 286	Esposito, Jr., John.....299	Fieve, Ronald R.....261, 286
Dunnington, John H.....242, 254, 274	Espy, John W.....259, 282	Filipescu, Paul.....282
Dunton, Harlow D.....261, 286	Esser, Aristide H.....262, 287	Finby, Nathaniel.....291
Durrer, Gustav T.....300	Esser, Robert A.....258, 280	Findlay, Jr., Charles W....264, 292
Duvoisin, Roger C.....257, 279	Estes, Dorothy .....256, 277	Fine, Daniel H.....300
Dvorak, Robert F.....291	Estrada, Victor .....294	Fine, Stanley R.....278
Dworkin, Samuel F.....272, 298, 300	Estrin, Elizabeth G.....261, 285	Fingerhut, Bruno.....294
Dwyer, Edward M.....270, 278	Etess, A. David.....262	Fink, Arnold I.....299
Dwyer, John F.....281	Etra, Bernard .....261, 285	Fink, Louis .....283
Dyer, William R.....258	Evans, Hugh E.....260, 285	Finkel, Jerry B.....262, 287
Dyrenfurth, Inge .....281	Evans, Nelson F.....290	Finkelstein, Ludmila S.....263, 292
Dyro, Frances M.....258	Ewing, Margaret L.....285	Finn, James E.....257
Eakins, Kenneth E.....282	Fadil, Richard .....294	Finster, Mieczyslaw .....254, 275
Earle, Ann.....268	Fairchild, Beatrice M.....279	Firestein, Stephen .....287
Earle, Anna M.....280	Falk, Eugene P.....260	Fischbarg, Jorge .....282
Eaton, Richard G.....293	Farhangi, Mehdi ....256, 277, 294	Fischel, Edward E.....255, 278
Eberle, Robert C.....260, 283	Farrell, Thomas A.....282, 293	Fischer, Anita .....287
Eckhaus, Morris .....300	Farrer, Sanford M.....284	Fischer, Rita .....261
Eckman, Judith .....287	Farris, R. Linsy.....259, 282	Fischer, Robert A.....254
Edie, Richard N.....264, 292	Fasy, Thomas.....260	Fish, George W.....242, 254, 274
Edmonds, Craig .....259	Faverio, Charles D.....256, 277	Fishberg, Max P.....300
Edmunds, Robert T.....293	Fay, Thomas H.....283	Fisher, Lloyd C.....256, 277
Edreira, Juan G.....277	Fazekas, Arpad G.....277	Fisher, Morton A.....289
Edsall, John R.....278	Feder, Samuel L.....287	Fisher, Pearl R.....290
Edwards, Malcolm.....257	Feigelson, Eugene B.....288	Fisher, Robert L.....299
Eftekhari, Nasseroddin ....259, 282	Feigelson, Muriel .....276, 281	Fisk, Shirley C.....255, 277
	Feigelson, Philip .268, 270, 275, 294	Fitzig, Charmaine M.....280
		Fitzpatrick, Hugh F.....293

PAGE		PAGE		PAGE	
Flack, J. Vincent.....	259	Gabriel, James B.....	278	Gilbert, Gay F.....	280
Flapan, Mark.....	287	Gabriele, P. Charles.....	299	Gilbert, Louis J.....	262, 287
Fleck, Jr., Andrew C.....	290	Gaerlan, Pura F. M.....	260, 285	Gilbert, Jr., Stanley H.....	285
Fleischman, Ray.....	257	Gaetz, Harold P.....	284	Gilder, Rodman.....	262, 286
Fleiss, Joseph L.....	289	Gaines, John E.....	258	Gill, Elizabeth S.....	274
Floch, Howard F.....	264	Galen, Robert S.....	260	Gillette, Nedra P.....	292
Flood, Charles A.....	254, 274	Gallinek, Alfred.....	258	Gilman, Sid.....	257, 268, 279
Fodor, Peter B.....	264	Galloway, Shelby.....	263, 291	Ginsberg, Allen D.....	289
Fodor, Raymond I.....	260	Gallozzi, Ennio.....	275	Ginsburg, Iona H.....	287
Fogel, Gerald I.....	287	Galton, Harry A.....	299	Ginsburg, Sara.....	280
Foley, Archie R.....	261, 286, 289	Galton, Robert.....	290	Giordano, Natale J.....	299
Follett, David A.....	263, 291	Galvin, Gerald M.....	300	Gitman, Leo.....	290
Forbes, Max.....	259, 282	Gambino, S. Raymond.....	260, 270, 283	Giuliani, Edoardo.....	293
Ford, Edna K.....	291	Gambito, Erlinda S.....	254	Givan, Jr., Thurman B.....	261, 285
Ford, Joseph.....	293	Gamboa, Eugenia.....	258, 279, 280	Gladstein, Mark O.....	259
Forde, Kenneth A.....	264, 269, 292	Ganepolo, G. Araccige.....	264	Gladstone, Leonore Z.....	263
Forester, Bruce.....	262, 287	Garber, C. Zent.....	260, 284	Glaser, Helen H.....	262
Forrest, Arnold W.....	259, 282	Garcia, Alexander.....	259, 265, 270, 282	Glaser, Robert J.....	277
Forrest, David V.....	287	Garcia, Helen-Ann.....	256, 277	Glaser, Stephen.....	260, 285
Forstenzer, Stephen L.....	290	Garcia, Leonardo.....	258	Glass, Blanche.....	288
Forster, Eugene.....	262, 287	Gardner, Jared J.....	260	Glass, Leonard.....	261, 285
Foster, Goodwin L.....	274	Gardner, Lee R.....	262, 287	Glassman, Alexander H.....	262, 286
Foster, Pearl D.....	278	Gardner, Richard A.....	262, 286	Glaven, Richard J.....	287
Fountzopoulou, Elpis.....	291	Gardner, Robert A.....	264	Glen, Dulaney.....	279
Fox, Jr., Charles L.....	279, 292	Gardner, William A.....	293	Glick, Alvin J.....	262, 287
Fox, Lavinia G.M.....	261	Garfein, Oscar B.....	278	Glick, Robert A.....	262, 287
Foy, Carol J.....	281	Garitano, William W.....	262	Gliedman, Monroe M.....	299
Frame, John D.....	289	Garnes, Arthur L.....	293	Gliedman, Richard.....	299
Franciscus, Marie.....	292	Garnes, Harold A.....	294	Glusman, Murray.....	262, 286
Francois, Egel.....	293	Garret, Rudolf.....	284	Gochfeld, Michael.....	289
Frank, Judith E.....	261, 285	Garrett, Alice L.....	259, 282	Gocke, David J.....	256, 277
Frank, Kenneth.....	287	Garrett, Thomas J.....	257	Godman, Gabriel.....	260, 279, 283
Frank, Marjorie H.....	290	Garvey, Glenda J.....	257	Goetz, Jack.....	299
Frankel, Olga.....	262, 286	Gaston, Sawnie R.....	259, 282	Golbey, Maurice.....	262, 287
Franklin, David N.....	261, 285	Gates, Marguerite J.....	260, 284	Gold, Aaron A.....	282
Frantz, Andrew G.....	255, 269, 277	Gates, Maurice A.....	280	Gold, Allen M.....	275
Frantz, Angus M.....	254	Gattegno, Edgar.....	298	Gold, Arnold P.....	258, 280, 284
Fraser, Owen D.....	264	Gavis, Gustave.....	261, 285	Gold, George.....	286
Fraser, Robert W.....	293	Gause, Robert W.....	259	Gold, Richard P.....	263
Freas, Karin E.....	281	Gaut, Zane H.....	278	Gold, Steven I.....	300
Freda, Vincent J.....	258, 281	Gavras, Haralambos.....	257, 277	Goldart, Jed.....	262
Frederickson, Keville.....	280	Gavras, Irene.....	257, 277	Goldart, Natalie.....	290
Freehafer, John G.....	285	Gayle-Thompson, Dolores J.....	285	Goldberg, Doris K. E.....	260
Freeman, Harold P.....	293	Gaylin, Willard.....	286	Goldberg, Ivan K.....	262, 287
Freeman, John E.....	259	Gearing, Frances R.....	289	Goldberg, Max.....	287
Fremont, Henry N.....	290	Geer, Francis G.....	279	Goldberg, Morrell.....	290
Fretz, Alfred F.....	294	Geiger, Arnold M.....	299	Golden, Ross.....	254, 274
Frick, II, Henry Clay.....	258, 281	Geller, Lester M.....	280, 283	Goldensohn, Eli S.....	257, 279
Friedberg, Eugene.....	262, 287	Gelman, Anna K.....	289	Goldfarb, William.....	261, 288
Friedman, Arnold P.....	257, 279	George, Edward.....	257	Goldin, Gurston.....	262, 287
Friedman, Joel.....	300	Gerbi, Claudio.....	256, 277	Goldin, Joel.....	300
Friedman, Paul A.....	257	German, Harold.....	257	Goldin, Victor.....	262, 287
Friedman, Richard C.....	262, 287, 294	Gersony, Welton M.....	260, 270, 284	Goldman, George.....	288
Friis, Robert H.....	289	Gerst, Paul H.....	264, 292	Goldman, Jack J.....	289
Fritts, Jr., Harry W.....	255, 276	Gerstein, Herbert.....	263	Goldman, Robert S.....	300
Fritz, Herbert P.....	298	Gersten, Joanne C.....	289	Goldsmith, Seth B.....	289
Fruchtbaum, Harold.....	289	Ghanta, Vijaya M.....	284	Goldstein, Inge F.....	290
Fukunaga, Atsuo.....	255	Gharib, Hossein.....	258	Goldstein, Irwin.....	256, 277
Fuld, Stuart L.....	263, 291	Giardina, Andrea-Camille V.....	285	Goldstein, Marc.....	264
Furey, Clement A.....	264, 294	Giardina, Elsa-Grace.....	256, 277	Goldstone, Jonas M.....	256, 279
Furman, Sylvan S.....	290	Gibbon, John.....	286	Goldwater, Eugene.....	262
Furth, Jacob.....	274, 284	Gibbs, Barbara C.....	288	Goldwater, Leonard J.....	274, 290
Futch, Charlton.....	264	Gibbs, Stanley L.....	299	Golitz, Loren E.....	255
		Gidro-Frank, Lothar.....	262, 286	Gollance, Harvey.....	290
				Gollub, Edith G.....	275

	PAGE		PAGE		PAGE
Gongaware, Robert D.....	264	Grokoest, Albert W.....	256, 277	Hands, Robert	293
Gongaware, Theodora L.....	257	Gross, Elliott M.....	284	Handzer, Bernardo	281
Gonzalez, Erwin G.....	263	Gross, Gary D.....	300	Hanford, John M.....	254
Goodbody, Maurice F.....	279	Gross, Paul	254	Hangorsky, Charlotte	298
Goode, Louise A.....	279	Gross, William	291	Hanks, Edgar C.....	254, 275
Goodfriend, Susan	290	Grossbard, Lionel	256, 277	Hannon, Virginia R.....	290
Goodman, DeWitt S.....	255, 276, 295	Grossman, Bertram H.....	261, 285	Hansen, Holger H.....	290
Goodman, Edmund N.....	264, 292	Gruber, Michael L.....	258	Hanson, Erwin E.....	279
Goodman, Fredric E.....	298	Gruenberg, Ernest M.....	261, 286, 288	Hanson, Ronald L.....	275
Goodman, Irving	275, 292	Grunberger, Dezider	275, 294	Harding, Errol N.....	275
Goodman, Jerome D.....	262, 286	Grundfest, Harry	274, 280	Harfeist, Elizabeth J.....	277
Goodman, Leon J.....	291	Guarin, Urbano K.....	294	Harisiadis, Leonidas	263
Goodman, Reba	283	Guichert, Iwan D.....	289	Haroldson, Jr., Olaf.....	260, 283
Goodman, Sol L.....	262, 286	Guinee, Vincent F.....	289	Harovas, Antoine C.....	278
Goodman, Stephen F.....	299	Gump, Frank E.....	264, 269, 292	Harris, David	290
Goran, Michael J.....	262	Gunning, Lucille C.....	285, 292	Harris, Herman S.....	300
Gordon, Allan D.....	288	Gunther, Stephen J.....	257	Harris, Paul D.....	293
Gordon, Howard	300	Gurewitsch, A. David	254, 292	Harris, Ruth C.....	260, 284, 295
Gordon, I. Bruce.....	261, 285	Gurian, Bernard	300	Harrold, Jr., Charles C.....	293
Gordon, Susan G.....	260	Gurian, Harvey	288	Hart, Edward J.....	258, 280
Gordon, Wally	262	Gurland, Barry	286	Harter, Donald H.....	257, 268, 279
Gorman, John G.....	260, 283	Gusberg, Richard J.....	264	Hartstein, Marvin L.....	264, 293
Gorman, Sheila A.....	290	Gustin, Byron W.....	257	Harvey, Harold D.....	254, 274
Goswami, Ajit K.....	281	Gutenstein, Beulah	290	Harvey, Rejane	255, 276
Gottsegen, Irving	290	Gutstein, Robert A.....	264	Hashim, Sami A.....	289, 295
Gottsegen, Robert	255, 271, 272, 299	Gutstein, Walter A.....	298	Hasselbacher, Peter	257
Graf, Liselotte	283	Guttmann, Ruth J.....	291	Hassman, Gary C.....	259
Graff, Ada M.....	275	Guzman, Maria A.....	262	Hatfield, Wendell B.....	256, 268, 269, 277
Graff, Samuel	275	Ha, Young H.....	259	Hatterer, Myra S.....	287
Graham, Fiona	262, 287	Haagensen, Cushman D.....	254, 274	Hauptert, Garner T.....	257
Granato, Robert	294	Haas, Joanna	257	Hawa, Charles S.....	258
Grandin, Dean J.....	258, 281	Haas, Robert L.....	299	Hawn, Clinton Van Z.....	284
Granich, Belle	294	Haber, Martha E.....	280	Hayes, Constance J.....	260, 284
Grant, Edward V	290	Haberman, Paul W.....	289	Hays, Arthur P.....	260
Grant, Jr., John P.....	264, 293	Habif, David V.....	264, 292	Heacock, Don R.....	286
Grant, Ronald A.....	262	Hager, Wesley P.....	257	Head, William B.....	262
Grantham, S. Ashby.....	259, 282	Hagstrom, Jack W. C.....	260, 268, 283	Healey, Jr., William V.....	293
Grappell, Paul M.....	263	Hahn, Fred I.....	287	Healton, Edward B.....	258
Graves, Oscar N.....	275	Hakki, Ahmed	287	Hecht, Paul	288
Grayson, Alvin J.....	300	Hakusa, Norma	287	Hecox, Bernadette	292
Grebin, Burton	260, 284	Haldeman, Jack C.....	290	Hehlmann, Rudiger	276, 295
Green, Albert	299	Hall, Bernard H.....	288	Heidelberger, Michael	274
Green, Donald H.....	259	Hall, Eric J.....	291	Heikkila, Richard E.....	280
Green, William M.....	263	Hall, Robert E.....	258, 281	Heilbrunn, Ernst	254
Greenbaum, Lowell M.....	270, 285	Haller, Jack	263	Heimarck, Gregory	287
Greenberg, Abraham	299	Haller, Raphael M.....	283	Heimbach, Sidney B.....	262
Greenberg, Carolyn P.....	254, 275	Halleran, Leo B.....	278	Heimlich, Donald L.....	293
Greenberg, Henry M.....	278	Hallock, Halford	259	Heintze, Achim	258
Greenberg, Richard A.....	298	Halper, James P.....	257	Heird, William	260, 284
Greenblatt, Irving J.....	289	Halpert, Wesley	299	Heissenbittel, Robert H.....	256, 277
Greene, Andrew F.....	259	Halvorsen, Gladys C.....	288	Helbig, Donald W.....	289, 294
Greene, Edward L.....	287	Hamaker, Ronald C.....	260, 283	Heller, Charles	263
Greene, Justin L.....	288	Hamilton, Gerald L.....	258	Heller, Joseph	256
Greene, Lynne T.....	242, 254, 275	Hamilton, Lewis L.....	258	Heller, Stanley S.....	262, 287
Greenfield, Edward	298	Hamilton, Jr., Lloyd A.....	262, 287	Hellerman, Don V.....	284
Greenspan, Kenneth	262, 287	Hamilton, William G.....	259, 282	Helming, Charles V.....	259
Greenwood, Albert	260	Hamlin, Linda K.....	280	Hembree, Wylie	256, 277, 281
Greer, Douglas F.....	259	Hamlin, Robert H.....	289	Henderson, Ann S.....	276, 294
Grey, Ross M.....	283	Hammer, Muriel	286	Henderson, I. Craig.....	257
Grieco, Michael H.....	256, 276	Hammer, Scott M.....	257	Hending, Herbert	286
Griffiths, Sylvia P.....	260, 284	Hammerling, Alden	290	Henley, Jean	275
Grinnell, Robert S.....	264	Hammill, James F.....	258, 280	Henneman, Philip H.....	278
Griswold, William R.....	261	Hanauer, Lonnie B.....	256, 277	Hennig, George C.....	256, 277
Grode, Marshall L.....	257	Handlers, Martin	298	Henretig, Robert D.....	291

PAGE	PAGE	PAGE
Henrikson, Ray C.....274	Horowitz, Sidney L	Jacox, Harold W.....254, 274
Henry, Douglas C.....261	255, 271, 272, 299	Jaffe, Conrade .....263
Henry, George K.....293	Hosannah, Hilton O.....298	Jaffe, David .....262, 286
Henry, Jack .....259	Hosiosky, Ellen N.....300	Jaffe, Joseph .....286
Herbert, Jr., Charles M.....291	Housepian, Edgar M.....257, 279	Jaffe, Mark H.....272
Herbert, Victor .....283	Howard, Clifton M.....262, 287	Jaffee, Lyn J. ....260
Herlands, Robert E.....300	Howard, Elliott J.....277	Jagiello, Georgianna
Herman, Jr., Emory C.....278	Howard, George M.....259, 282	268, 276, 281, 294
Hermann, William H.....290	Howell, J. Taylor.....254	James L. Stanley
Herr, Conrad E. A.....291	Howland, Peter A.....288	260, 268, 274, 284
Herrero, Fernando .....258	Howorth, Irving T.....290	James, William A.....259
Herson, Joseph H. ....287	Hoynak, Rose M.....280	Jameson, A. Gregory.....278
Herter, Frederic P.	Hsu, John T.....291	Jan, Kung-Ming .....286
242, 264, 270, 292	Hsu, Konrad C.....279	Janecka, Ivo .....264
Herz, Marvin I.....262, 286	Hsu, Shih-piao .....254	Jansky, Jeannette J.....285
Herz, Jr., Ralph J.....256, 277	Hu, Ian .....299	Jaramillo-Gomez, Mario .....294
Herzlinger, Robert A.....261, 285	Huckaba, Charles A.....291	Jaretzki, III, Alfred..264, 270, 292
Hess, Alfred .....263	Huckaby, Henry L.....264	Jarrahay, Parviz .....258
Heyendal, Richard N.....254	Huettner, Robert J.....299	Jarvik, Lissy F.....286
Hiatt, Robert B.....264, 292	Hugg, Terry W. ....262	Jason, Donald R.....260
Hickey, Paul R.....264	Hughes, James E. O.....279	Javert, Carl T.....281
High, E. Jeffrey.....290	Hui, Robert M.....259, 265, 283	Jeffrey, John C.....289
Hilal, Sadek .....263, 291	Humphreys, II, George H.	Jenkins, Alva .....291
Hill, Jane C. ....284	242, 254, 274	Jenks, Bethanne .....261
Hilton, James G.....278	Hunt, Howard F.....286	Jennings, Robert E.....261, 284
Hindels, George W.....300	Hunt, Jr., Robert M.....274	Jensen, Philip B.....264, 294
Hinds, Archibald K.....275	Hunt, Winslow R.....262, 286	Jerome, Marc A.....281
Hines, Henry L.....255, 276	Husain, Kazim .....257	Jervis, George A.....261, 288
Hirsch, Donald R.....258	Husain, Musa K.....257	Jewelewicz, Raphael ..258, 281, 294
Hirsch, Robert L.....283	Hussey, Kathleen L.....288	Jewel, Kenneth .....263, 291
Hirschfeld, Leonard S.....299	Hutchings, Donald E.....286	Jewett, Frank .....287
Ho, Sai Hang .....261	Hutchinson, John E.....264, 293	Johnson, Christopher A.....291
Hoberman, Morton .....263, 291	Hyman, Allen I.....254, 268, 275	Johnson, James J. ....298
Hochberg, Richard .....281	Hyman, George A.....256, 277	Johnson, Lewis A.....260, 283
Hochman, Sidney A.....255	Hyman, Sonia W.....262, 288	Johnson, Lynne .....257
Hochroth, Fadel M.....285	Iacuzzo, John C.....264	Johnson, Paul K.....256, 277
Hochstetter, Werner .....262	Iaquanta, Frank E. ....289	Johnson, Philip M.....263, 291
Hodas, Morton M.....262, 287	Ifarraguerri, Carlos .....262, 287	Johnson, Jr., Raymond F.....299
Hoefer, Paul F. A. ....254, 274	Iglehart, Vivian R. ....285	Johnston, Austin D...260, 282, 283
Hoeffe, Frank B. ....259, 282	Ikiriko, Sagbe .....265	Jones, Althea M.....292
Hoffman, Brian F.	Imbriglia, Joseph E. ....259	Jones, Barbara .....294
242, 261, 268, 269, 271, 285	Ingraham, Hollis S.....289	Jones, Ira Snow.....259, 282
Hoffman, Joel S.....262, 287	Ingram, Vernon M.....278	Jones, Julia B.....276
Hofmann, Frederick..268, 269, 285	Ingram, Willard J.....264	Jones, Julia M.....256, 277
Hogan, James A.....256, 277	Ioachim, Harry L.....283	Jones, Thomas W.....291
Hogan, Judith R.....292	Ionescu, Gheorghe D.....265	Jordan, Herman C.....282
Hogan, Patrick A.....258	Iorio, Philip M.....254	Josen, Autar S.....293
Holgate, Richard E.....263	Irwin, Richard S.....257	Josephson, Eric .....289
Holgerson, Leif O.....293	Isaacson, Robert .....299	Joshi, Usha M.....294
Hollander, Bentley A...263, 291	Isobe, Takashi .....294	Ju, David M. C.....264, 292
Holliday, Houghton H. ....298	Iverson, David .....262, 287	Juhlin, Einar A.....255, 276
Hollyfield, Joe G.....282	Iwamoto, Takeo .....282	Junemann, Henry R.....299
Holt, Peter R.....256, 270, 278	Jack, Robert L.....259	Jung, Hyun J. ....260
Holtzman, Robert .....258	Jackobiec, Frederick A.....259	Justice, Michael W.....264, 293
Holub, Donald A....242, 256, 277	Jackson, Bettie S.....280	Justman, Daniel .....262, 287
Holzman, Alfred .....300	Jacob, Ginette B.....256, 277	Jutkowitz, Arnold S.....300
Hopewell, William S.....279	Jacobs, Jerry C.....260, 284	Kabat, Elvin A.....257, 276, 279
Hopf, Frank R.....298	Jacobs, Martin H.....285	Kacian, Daniel L. ....276, 294
Horan, Anthony .....265	Jacobs, Thomas P.....257	Kadis, Gerald .....264
Hordof, Allan .....261	Jacobson, Ivan V.....281	Kafer, Joseph E.....298
Horiguchi, Terusada .....281	Jacobson, Linbania .....280, 294	Kahn, David A.....288
Horn, James B. ....299	Jacobson, Robert L.....298	Kahn, Erich J.....260, 285
Horowitz, Ira A.....263, 291	Jacovelli, Joseph .....275	Kahn, Norman .....269, 272, 285
Horowitz, Jacob .....290		Kaim, Patricia S.....263, 291
Horowitz, Peter E. ....255		

PAGE	PAGE	PAGE
Kaimakliotis, Elias M. 256, 277	Keller, Stephen 281	Koch, Hyman D. 298
Kalbacher, Joseph E. 284	Kellerer, Albrecht M. 281	Koehler, Judith P. 258
Kalinich, Lila 262	Kelley, Margaret A. 281	Koenigsberger, M. Richard 258, 280, 284
Kaloss, William A. 285	Kellogg, Marjorie 292	Koester, Charles J. 282
Kamm, Ronald L. 262	Kelly, Dennis D. 286	Kohl, Schuyler G. 290
Kanda, Yoshikazu 277	Kelly, William G. 282, 286	Kohl, Steve 255
Kandel, Denise B. 287	Kemeny, Mary M. 264	Kokic, Olga 258
Kane, Kendall K. 284	Kemp, Harvey G. 279	Kolb, Lawrence C. 242, 243, 261, 268, 269, 270, 286
Kane, Rosamond 259, 282	Kendall, Forrest E. 274, 276, 278	Kolody, John T. 290
Kangos, John J. 261, 284	Kennedy, James A. 277	Komma, Donald J. 276
Kanick, Virginia 291	Kennedy, William R. 259	Kopeloff, Lenore M. 286
Kantor, Martin 262	Kerst, Richard N. 242, 243, 251, 270, 290	Kopff, Jr., Richard G. 288
Kanzler, Maureen B. 286	Kessler, Bruce E. 257	Koplon, Burton S. 255, 276
Kao, Chien-Kuo 254	Kessler, Harry S. 284	Kornfeld, Donald S. 262, 268, 286
Kapit, Hanna E. 287	Kessler, Walter R. 260, 283	Kornfeld, Paul 300
Kaplan, David 272, 298	Kestenbaum, Clarice J. 262, 288	Koss, Michael N. 260
Kaplan, Jacob I. 299	Khalaf, Sahail 258	Kossmann, Richard J. 259, 282
Kaplan, Milton M. 282	Khambatta, Hoshang J. 254, 275	Koster, Seymour 299
Kaplan, Nathan 263, 292	Khanna, Shyam M. 283	Kovach, John S. 256, 277
Karanas, Arthur 278	Kiang, Selina C. 276	Kovar, Milan P. 260
Karel, Irving A. 299	Kiernan, Howard A. 259	Kovarsky, Abraham C. 259, 282
Karelitz-Karry, Marie 255	Kightlinger, Benjamin N. 279	Kowarski, Szloma 286
Karis, Joannes H. 254, 268, 275	Kilcoyne, Margaret M. 256, 277	Krajewski, Pauline 281
Karkas, John D. 275	Killian, Paul 256, 278	Kramer, Fred R. 295
Karl, William F. 275	Kim, Hie Chul. 263	Kramer, Jeffrey 288
Karlan, Frances R. 300	Kim, Myung 259	Kranzler, Jeffrey 263
Karlan, Marc 260	Kim, Ronald C. 260	Krasna, Alvin I. 268, 275
Karlin, Arthur 280, 286	Kimley, Altea 281	Kremzner, Leon T. 275, 280
Karmioli, Mortimer 300	Kimmey, James R. 289	Krenis, Laurence J. 275
Karron, Betty 262	King, Donald L. 263, 268, 291	Kriegler, Paul A. 260
Karshan, Maxwell 274	King, Donald W. 242, 260, 268, 269, 270, 271, 272, 283	Kritzler, Robert A. 256, 277
Karten, Irving D. 258	King, Marvin B. 299	Kroll, Jeffrey J. 255
Karush, Aaron 261, 286	King, Mary E. 283	Krom, Wilfred 259, 282
Katis, James G. 262, 287	Kinney, John M. 264, 292	Krongrad, Ehud 261, 284
Katsampes, Chris P. 261, 284	Kinzel, Augustus F. 287	Kronman, Barry S. 260
Katz, George M. 280	Kiriakopoulos, George 299	Krooth, Robert S. 255, 268, 269, 276
Katz, Harmon R. 298	Kirschberg, Gordon J. 258	Krugman, Robert L. 263
Katz, Lawrence 259	Kirschner, Corinne 290	Krumerman, Martin S. 284
Katz, Michael 242, 260, 263, 288, 295	Kirsten, Edward B. 285	Kufe, Donald 295
Katz, Ronald L. 254, 269, 274	Kisic, Alemka 275, 287	Kulkarni, Mohan H. 254
Katz, Solomon L. 299	Kister, Sven J. 264, 292	Kumler, Fern R. 280
Katz, Stephen R. 300	Kitchin, F. David 277	Kuo, Betty C. M. L. 261, 285
Katz, Steven E. 288	Kittridge, Richard D. 291	Kuo, Nicetas H. 289
Katz, Vivienne 292	Klagsbrun, Samuel C. 288	Kupersmith, Joel 285, 292
Katzman, Merle H. 259, 282	Klatskin, Bertram 255, 299	Kutner, Philip 299
Kauderer, John G. 277	Klavins, Janis V. 283, 284	Kutscher, Austin H. 255, 271, 300
Kauffman, John W. 290	Klein, Henriette R. 288	
Kaufman, Edward 287	Klein, Herman O. 285	
Kaufman, Herman 275, 287	Klein, Nora J. 261	
Kaufman, Howard H. 257	Kleinman, Abraham M. 290	
Kaufman, Mavis 283, 286	Klempert, Milton 299	
Kaufmann, Carole A. 280	Klenk, Eugene L. 261, 284	
Kaul, Surendra 258	Klepak, Daniel 290	
Kaunitz, Hans 256	Klinck, Inez E. 268	
Kavaler, Florence 289	Kline, Nathan 288	
Kavey, Neil B. 262	Klockars, H. L. G. Matthias 294	
Kawai, Masataka 280	Kloth, Edward W. 288	
Kaye, Gordon I. 268, 283, 292	Klyvert, Marlene 272, 298	
Keating, Jr., John H. 279	Knapp, Philip 259, 282	
Keenan, Richard 275	Kneeshaw, Muriel F. 281	
Kehayes, Alexander R. 254	Knowlton, Abbie I. 256, 277	
Keill, Ann G. 262, 287	Knox, W. Graham 293	
Keim, Hugo A. 259, 282	Kobrin, Donald 258	
Keitzman, Mitchell L. 287		
		Labow, Theodore A. 255, 276
		Laderman, Peter 262, 287
		Ladopoulos, Constantine P. 256, 277
		Laidlaw, Arthur E. 285
		Laine, Saidel 254
		Lallemant, Roger 255
		Lam, George F. 276
		Lamb, Jr., Albert R. 256, 265, 269, 277
		Lamb, Charles W. 287
		Lambert, Adrian 293
		Lambert, John P. 262, 286
		Lambert, Jr., Samuel W. 256
		LaMotte, Peter 259, 283
		Lan, Janet A. 257
		Landau, Stanley J. 264, 294

	PAGE
Landau, Tamar	294
Lane, Frederick	287
Lane, Nathan	260, 283, 292
Lang, Catharine I.	277
Lang, Enid	262
Lang, Peter	261
Lang, R. Russell	283
Lang, Robert R.	260
Langer, Burton	299
Langer, Terry	257
Langford, William S.	254, 274
Langmann, Alfred G.	254
Langner, Thomas S.	288
Lanks, Karl W.	260
Lantzounis, Leonidas A.	259
Lapkin, Michael L.	261, 285
Laragh, John H.	242, 255, 268, 270, 277
Larson, Daniel L.	256, 277
Lasoff, Gustave	299
LaSota, Eugene P.	255, 300
Lattes, Conrade	293
Lattes, Raffaele	260, 283, 292
Lattimer, John K.	242, 243, 264, 268, 269, 293
Lauderdale, Jr., Vance ..	259, 275
Laury, Gabriele V.	262, 287
Lavorgna, Lorenzo S.	261
Lawrence, Margaret M.	288
Lax, Henry	256
Lazar, Norman	262, 286
Lazaro, Nomenida A.	281
Lazarus, George M.	261
Leahey, Edward B.	270, 282
Leake, III, Hunter C.	284
Lear, Walter J.	289
Leavitt, Joseph M.	271, 272, 298
LeBlanc, Wiener	261, 285
LeBourhis, Elizabeth E.	285
LeDoux, Margaret R. Murray ..	274
Lee, Arnold St. J.	275
Lee, Chuck-Kwan	261
Lee, Hang-Chiang	254
Lee, Jai-Hoan	254
Lee, Wei-Li S.	276
Lee, William M.	257
Lee Woon Soon	288
Leeb, I. Joel	298
Lefer, Leon	262, 287
Lefkowitz, Lawrence A.	259
Lefkowitz, Nathan	290
Legato, Marianne J.	278
Leggiadro, Peter C.	291
Lehnert, Shirley	291
Leidy, Grace A.	285
Leifer, Edgar	256, 268, 277
Leiter, Naomi	262, 287
Leland, James L.	256, 278
Lell, Mary Elizabeth	258
Lenke, Roger B.	258
Lennon, Jr., Arthur J.	256, 279
Lennon, Eura M.	280
Lennon, Richard G.	259, 282
Lenz, Maurice	254, 274
Leon, Guillermo	254

	PAGE
Leonard, H. Skipton	290
Lerner, Burton A.	256, 287, 294
Lerner, Roger L.	256, 277
LeRoy, E. Carwile	256, 277
L'Esperance, Jr., Francis A.	259, 282
Lesser, Stanley R.	286
Lesser, Stanley R.	286
Leuzzi, Anthony P.	287
Levay, Alexander	262, 286
Levi, Joseph A.	290
Levi, Michael M.	281
Levine, Eugene M.	298
Levine, Jacob	290
Levine, Laurence J.	255, 300
Levine, Raphael K.	259
Levine, Richard U.	258
LeVine, Robert D.	261
Levinson, Alma	288
Levitan, Stephen J.	262, 287
Levitt, Lawrence I.	287
Levitt, Morton	287
Levy, Henry P.	299
Levy, Magda	291
Levy, Robert L.	254, 274
Lewis, Jr., John L.	281
Lewis, John S.	283
Lewis, Linda D.	258, 265, 280
Lewis, Milena L.	278
Lewis, Robert	294
Li, Florence	263
Li, Lu-Ku	282
Liben, Florence	262, 286
Lichtenberg, Mark S.	255
Lieberman, Gerald	261, 285
Lieberman, Seymour ..	275, 281, 294
Liebert, Robert S.	262, 287
Liebmann, Max	255
Liegner, Leonard M.	291
Lifson, Sol S.	290
Lighter, Gary L.	299
Lin, Chin-Chu	258
Lind, John K.	255, 300
Lind, Mary P.	280
Lindaman, Francis C.	268, 289
Lindenbaum, John ..	242, 256, 278
Lindig, George F.	298
Lindo, J. Trevor	288
Linz, Andrew M.	272, 299
Lipman, Marvin M.	256, 277
Lipow, Walter I.	299
Lipper, Evelyn	261
Lipson, Diane	262
Lipton, Brian P.	287
Lisio, Arnold L.	256, 277
Lissenden, Carolkay	261, 285
List, Theodore A.	258
Littler, J. William	293
Lituchy, Stanley	262, 287
Liu, Hilda H. C.	275
Livingston, Peter A.	263, 291
LiVolsi, Virginia	260
Lloyd, Kenneth O.	275, 276
Lo, Lan Wei	279
Lodyjensky, Catherine	285
Loeb, John N.	256, 277

	PAGE
Loeb, Robert F.	242, 254, 274
Loewenstein, Regina	289
LoGerfo, Paul	264
Loh, Vivien S.	260
Lohmann, Melvina J.	281
Lokietek, Suzanne	258
Lombardo, Peter C.	249, 276
Lomeo, Alberto M.	281
Londono, Juan B.	294
Lonesome, Ronald B.	262
Long, Calvin	292
Long, Margaret E.	284
Longo, Frank W.	264, 265, 268, 293
Lopez-Ovejero, Jorge	257
Lorenc, Ronald B.	260
Lorin, Martin I.	255, 278
Loscalzo, Louis J.	255, 299
Loutsch, Erica	262
Lovejoy, William P.	242, 256, 277
Lovelace, Robert E.	258, 280
Low, Barbara W.	275
Low, Niels L.	258, 280, 284
Lowd, Edwin	264
Lowman, Cherry L.	290, 295
Lowy, Samuel	262
Lozzi, Virginia	262, 287
Luban, Joseph	255, 300
Lubarr, Alan	299
Lubart, Joseph	262, 286
Lubin, Martin I.	288
Lucas, Rogelio	260
Lucca, John J.	255, 271, 272, 300
Luckett, W. Patrick	274
Luhrmann, Jr., George W.	262, 287
Luke, Wallace W-K.	292
Lum, Gifford	260
Lundberg, Walter B.	257
Lunn, Joseph S.	278
Lutz, Walter G.	263, 291
Lynch, Geraldine M.	280
Lynch, Hollis R.	295
Lyons, George V.	298
Lythcott, George I.	260, 268, 269, 270, 284
McAllister, Ferdinand F.	264, 269, 292
McCabe, Robert E.	293
McCaffrey, Raymond M.	258, 281
McCann, Mary B.	295
McCarthy, Elizabeth D.	290
McClane, Kenneth A.	256, 277
McClement, John H.	256, 278
McClennan, Bruce L.	263, 291
McColleston, Duncan L.	292
McConnell, David J.	256, 269, 277
McConville, Jane F.	280
McCord, Colin W.	293
McCormack, Jr., George H.	256, 277
McCormick, Floyd W.	290
McCormick, George W.	261
McCormick, Miriam A.	281
McCosker, James P.	300
McCray, Richard S.	279
McDonald, Reynard J.	278

PAGE	PAGE	PAGE
McDougal, John S. 257	Marcus, Joseph 258	Merriam, Jr., George R. 243, 259, 265, 282
McEachern, Irene C. 281	Marcus, Stuart 288	Merriam, Walter W. 259
McElroy, D. Keith 259, 282	Marder, Michael Z. 255, 300	Merritt, H. Houston ... 242, 254, 274
McGill, William J. 268, 271	Margolin, Michael M. 258	Merritt, Katharine K. 260
McHugh, Burton P. 279	Margulies, Lola 275	Mertz, Philip 262, 287
McIntosh, Rawle M. 260, 284, 295	Marinovich, Mato L. 256, 277	Merwin, Grier 265
McIntosh, Rustin ... 242, 254, 274	Mark, Lester C. 254, 274	Merz, William G. 276
McKinney, Dona E. W. 272, 298	Markee, Shirley J. 254, 275	Mesec, Donald F. 288
McKinney, John McD. 257	Markowitz, Alfred M. 264, 292	Mesnikoff, Alvin 287
McLaughlin, Mary C. 290	Markowitz, Robert 290	Messer, Henry D. 279
McLean, Patricia A. 271, 272, 298	Marks, Paul A. 242, 243, 255, 268, 269, 270, 271, 276	Messler, Eunice 280
McLellan, William L. 283	Marley, Catherine A. 260	Metcalf, Kenneth M. 261
McMath, Jonathan C. 258	Marolla, Francis A. 290	Mettler, Frederick A. 274, 279
McMurtry, III, James G. 257, 279	Marquez, Cecil G. 278	Meyer, Karl 274, 276, 278
McNeil, George N. 257	Marquit, Bela 260	Meyer, Michael 277
McNulty, Edward C. 299	Martin, Dean N. 261, 285	Meyers, Donald I. 287
McWhorter, John E. 257	Martin, Eugene M. 262, 287	Meyers, Helen C. 262, 286
Macauley, Cecelia A. 292	Martin, Josephine D. 287	Meyers, Milton 264
Macdonald, Aildred A. 261	Martinez, Leonor 263	Mezza, Alfred J. 299
MacDonald, James A. 293	Martorano, Joseph T. 288	Micavich, Michael A. 255
Mack, Theodosia H. 275	Martyn, J. A. Jeevendra. 255	Michels, Robert .. 262, 269, 270, 286
Mackay, Mary C. 262, 286	Marx, Alvin J. 284	Michelsen, Christopher B. 259
Macken, Daniel L. 256, 277	Marx, Herbert J. 278	Michelsen, W. Jost. 257, 279
Macken, Kevin L. 291	Masland, Mary W. 280, 283	Migel, Peter F. 261
Mackie, Robert W. 279	Masland, Richard L. 242, 257, 268, 269, 270, 279	Mignogna, Frank V. 260, 283
MacKinnon, Roger ... 262, 265, 286	Mathers, James A. L. 256, 277	Milano, Michael R. 262, 287
Maclean, Neil M. 262, 287	Mathews, Robert S. 259, 282	Milch, Eli 264
MacLean, William A. 257	Matis, Jacob D. 278	Milch, Peter O. 277
MacMillan, Roger W. 264	Matorin, Susan 287	Milic, Ann M. 258
Madigan, Jr., John C. 264	Matseoane, Stephen L. 281	Milici, John A. 288
Mahadik, Sahebarao P. 275	Matsuo, Joshiro 278	Miller, Barnett M. 293
Mahendran, Canagasoorian ... 280	Matteo, Richard S. 254, 275	Miller, Bess I. 290, 295
Mahoney, Katherine E. 280	Matthews, Robert S. 284	Miller, Jr., Donald W. 264
Maier, Herbert C. 264, 292	Mauro, Alexander 280	Miller, Dorothy A. 276
Maines, Susan C. 280	Maurasse, Corazon 255	Miller, Douglas 278
Mainieri, Nunzio 264	Max, Martin 264	Miller, Dulcy B. 290
Malfoix, Pamela J. 276	May, Paul S. 290	Miller, J. Lowry. 254, 276
Malik, Krishan 254, 275	Mayer, Gerda 279	Miller, Jordan 254, 275
Malitz, Sidney 242, 261, 286	Mayer, Shirley A. 261, 284	Miller, Orlando J. 258, 276, 281
Malkin, Stanley 258	Mayeron, Donald J. 288	Miller, Robert E. 293
Mallia, Anantha K. 277	Mayrowetz, Burton 257	Miller, William 298
Mallis, George 257, 277	Medof, M. Edward 257	Miller, William J. 300
Malm, James R. 242, 264, 292	Mega, Richard S. 260	Millet, John A. P. 262
Maloney, Milton 290	Megalli, Magued R. 265	Mills, Donald R. 276, 294
Maloo, Waleed G. 294	Meier, Werner 261	Milner, Max 290
Malouf, Renee 258	Meineker, Robert L. 288	Milstein, Mona 261
Mancao, Maylinda 254	Meistrell, Jr., Malcolm E. 299	Mindell, Irwin 298
Mancusi-Ungaro, Pier ... 256, 277	Mekhjjan, Haroutune 293	Miner, Robert D. 300
Mandel, Irwin D. 255, 271, 272, 300	Melcher, Jr., George W. 256, 277	Miner, Walter W. 293
Mandel, Louis 255, 299	Melia, Daniel J. 261, 284	Minervini, George A. 255, 271, 272, 299
Mandl, Ines 275, 281	Mellicow, Meyer M. 264, 274, 294	Mintz, Beatrice 289
Manger, William M. 256	Mellana, Frank L. 298	Mintz, Ira L. 287
Maniatis, Alice 279	Mellin, Gilbert W. 260, 269, 284	Mitchell, Doris J. 284
Maniatis, George M. 276	Mellins, Robert B. 260, 269, 284	Mitchell, Jr., Walter L. 261, 284
Mankoff, Mark R. 262, 284	Mellups, Ludmila Z. 255	Mithen, Francis A. 264
Manning, Lucille D. 281	Meltzer, Herbert I. 275, 286	Modak, Shanta M. 292
Manski, Wladyslaw 279, 282	Meltzer, Jay L. 256, 277	Mohammed, Noel D. 281
Mansky, Marvin 300	Mendelsohn, Frederick S. 287	Mohsen, Ahmed 255
Maqbool, Sajid 285	Mcnder, Stephen 300	Moldaver, Joseph 258
Marano, Anthony J. 278	Menendez, Carlos E. 257	Moley, Malcolm 293
Marbach, Joseph J. 255, 300	Meriney, David K. 278	Molloy, Joseph A. 292
Marco, Luis A. 280	Merker, Charles 292	Monahan, David M. 299
Marcotte, Reo J. 290		Mones, Richard L. 261

PAGE	PAGE	PAGE
Mongiardo, John J.....300	Nahas, Gabriel G.....254, 275	Oakman, Carl S.....293
Monterrey, Maximo R.....288	Nahoun, Henry I.....255, 271, 299	O'Brien, John D.....262, 287
Montgomery, James W.....287	Naidorf, Irving J.....255, 272, 298	O'Brien, Joseph E.....284
Mook, William H.....278	Nakazawa, Hiroshi .....284	O'Brien, Joseph L.....258, 280
Mooney, James .....265	Nall, Thomas M.....278	O'Connell, C. Paul.....258
Moore, Austin .....288	Nambiar, Gopalan .....263	O'Connor, John F.....262, 286, 294
Moore, David B.....258, 281	Nape, William J.....287	Odrich, Ronald B.....299
Moore, Richmond L.....254	Napoli, Joseph C.....261	O'Grady, George L.....255, 271, 272
Moore, Sally A.....282	Nash, Artemis D.....284	Oh, Tae Hee .....255
Moore, Thomas J.....260, 285	Nash, Lillian D.....258, 281	O'Hare, Daniel .....290
Morjani, Damyanti G.....263	Nastuk, William L.....286	Oliva, Jose .....294
Mora, George .....288	Natta, Clayton L.....256, 278	Olivén, John F.....262
Moran, Denis .....282	Nauen, Richard .....290	Olsen, John E.....293
Morea, Dennis N.....300	Navarro, Carlos .....284	Ollstein, Ronald N.....293
Moreinis, S. Abel .....298	Nay, Howard .....293	Oman, Carl R.....254, 298
Morgan, Councilman	Nealis, James G.....261	O'Neill, Francis J.....288
257, 268, 269, 279	Neer, II, Charles S.	O'Neill, Margaret A.....292
Morgan, Francis J.....277	242, 243, 259, 282	Oppenheimer, Armand M.....299
Morgan, Harry .....263, 291	Neergaard, Arthur E.....256	Orenstein, Jan M.....260
Morgenstern, Thomas F.....300	Nelson, Carl T.	Ores, Celia .....261, 285
Morishima, Akira .....260, 284	242, 243, 255, 269, 276	Orlin, Harvey .....259, 282
Morishima, Hisayo O.....275	Nelson, William J.....294	Ort, Constance B.....280
Morley, Jr., Kenneth C.....264, 293	Nemon, William J.....262, 287	Ortiz-Neu, Carmen .....256
Morris, John deL.....291	Netupsky, Morton .....299	Orzeck, Lida .....290
Morris, Melvin L.....299	Neu, Carmen .....277	Osborn, Morris A.....258
Morris, Thomas Q.....256, 277	Neu, Harold C.....256, 269, 270, 277	Oscoff, Habiv A.....255
Morrison, Stanley .....261, 285	Neuberg, Hans W.....256, 277	Oser, Bernard L.....289
Morse, Jane H.....256, 277	Neuberg, Marc E.....256	Oshrain, Herbert I.....300
Morton, Robert F.....293	Neuhaus, Barbara E.....292	Osler, Geoffrey F.....258, 280
Moscarella, Alfred A.....293	Neuhaus, Ralph K.....300	Osserman, Elliott F.....255, 276, 294
Mosher, Paul W.....287	Neuwirth, Robert S.....258, 281, 294	Ostreicher, Herbert P.....299
Moskow, Bernard S.....299	Newberg, Marc E.....277	Otero, Alberto .....264
Moskowitz, Reed C.....262	Newman, John H.....257	Overholser, Jr., Winfred...262, 286
Moss, Hugh MacMillan...259, 282	Newman, Robert D.....284	Ovesey, Lionel .....286
Moss, Leonard M.....262, 287	Newton, James C.....282	Ozanics, Victoria .....282
Moss, Melvin L.	Ngai, Shih-Hsun .242, 254, 269, 275	
242, 255, 269, 271, 272, 274	Ngo, Ignacia .....275	Pacella, Bernard L.....261, 288
Moss-Salentiin, Letty .272, 274, 299	Nicholas, William M.....278	Pachter, M. Richard.....284
Moulton, Anthony L.....264	Nicholson, John F.....260, 284	Pachtman, Harold .....260
Moulton, Ruth .....286	Nicklas, William J.....280	Padovano, Louis .....263, 288
Mount, Frank W.....289	Niemi, William D.....280	Page, Malcolm I.....278
Mount, Lester A.	Niinaka, Toru .....285	Pai, Lucille Tsu .....263, 292
242, 243, 257, 269, 279	Nikias, Mata K.....289	Paidoussi, E. Rea.....262, 287
Moyer, Richard .....269, 275	Nikonorow, Andrzej .....288	Painter, Michael .....258
Mudd, John W.....262	Nishihara, Tohru .....294	Pakter, Jean .....290
Mudge, Jr., Gilbert H.....257	Nishimura, Hiroko .....285	Palesty, John .....260, 283
Mueller-Heubach, Eberhard A...258	Nisonson, Barton .....259	Pancoast, Stephen J.....257
Mufson, Isidor .....256	Nixon, Joseph J.....259	Pandolfo, Frank W.....298
Muir, Keith M.....263	Noback, Charles R.....269, 272, 274	Pang, Leila M.....255
Mukherjee, Nrisingha .....281	Noble, Robert P.....256, 277	Pang, Peter K. T.....285
Mulcare, Robert J.....293	Nobuji, Maeda .....275	Pantuck, Eugene J.....254, 275
Mulder, Martien A.....293	Nocenti, Mero R.....269, 272, 286	Papanek, George O.....269, 288
Mumford, Robert S.....262, 287	Noel, Gordon .....257	Paris, Martin .....257
Munnell, Equinn W.....258, 281	Noonan, Richard J.....290	Park, Molly H.....290
Muroff, Lawrence R.....263	Nordsiek, Frederick W.....289	Park, Sungmin .....261
Murphy, Eugene F.....299	Norris, Tom R.....259	Parke, Priscilla C.....281
Murphy, Quentin M.....299	Norton, Jerry L.....288	Parker, Frieda .....260
Murphy, Ramon J.....261	Norwint, Hanna .....263	Parker, Jr., John W.....293
Murray, Jeanne B.....280	Nos, Jaime .....263	Parkes, II, James C.....259, 283
Murty, V. L. N.....275, 282	Nosher, Charles .....263	Parkin, Robert P.....262, 286
Myers, Stanley J.....263, 265, 292	Nossel, Hymie L.....255, 276	Parkins, George K.....264
	Nova, Harvey R.....284	Parks, Thomas J.....258
Nachmansohn, David .274, 276, 280	Novick, Lloyd F.....289	Parry, Michael F.....257
Nag, Moni .....289, 294	Nowygrad, Roman .....264	Parris, Noel F.....291
Nagai, Ali H.....255	Nozawa, Masumi .....293	

	PAGE		PAGE		PAGE
Parshley, Mary S.....	274	Pino, Daniel M.....	254, 275	Quash, Eugene	293
Parson, Narendra	255	Piore, Nora	289	Quereshi, Gherlam D.....	257
Parsons, William Barclay.....	254	Pippenger, Charles E.....	280	Quest, Donald	257
Passamanick, Benjamin	289	Pirani, Conrad L.....	260	Quimby, Edith H.....	274
Pascal, Robert	260, 269, 283	Piro, John D.....	260, 283		
Pascarelli, Emil J.....	290	Piskacek, Vladimir R.....	262, 287	Rabin, Herbert M.....	288
Pasquariella, Bernard G.....	294	Pi-Sunyer, Francis X.....	256, 279, 295	Rabinowitz, Herbert	299
Patchell, Robert D.....	281	Pitkin, Olive E.....	290	Rachelson, Morton H.....	261, 284
Patel, Dhun B.....	289	Pitman, Gerald H.....	264	Rachleff, Alan N.....	254, 275
Patrick, Jr., Thomas W.		Pitt, Jane	256, 285	Rackow, Herbert	254, 275
	261, 284, 295	Plishner, Meyer J.....	290	Radichevich, Ildiko	276, 277
Patterson, Andrew H.....	259	Poch, Herbert E.....	261, 284	Radkowski, Mary Ann.....	291
Patterson, Myron C.....	278	Poillon, William	275, 280	Raebeck, Jr., William.....	300
Patterson, Richard W.....	254, 275	Polanco, Altigracia	275	Rafferstein, Bernadette	257
Pattner, Austin M.....	257	Polatin, Alvin H.....	262, 286	Ragan, Charles A.	
Patton, Robert E.....	287	Polatin, Phillip	254, 274		242, 243, 255, 269, 270, 276
Paul, Dina D.....	287	Polk, Gene A.....	285	Rainer, John D.....	261, 276, 286
Paul, Henry A.....	263	Polk, Irwin J.....	285	Rajegowda, Benamanahalli	285
Pawar, Smitri	280	Pollack, Arthur C.....	258	Rakic, Milovan T.....	256, 277
Payne, John A.....	281	Pollack, Donald O.....	278	Ramirez, Francesco	276
Payumo, Carmelino C.....	255	Pollack, Linda	261	Randall, Frederick R.....	264, 293
Pecikyan, Renc	277	Pollack, William	284	Rankow, Robin M.....	260, 283
Pedersen, Hilda	254, 275	Pollock, Edward J.....	263, 291	Rapoport, Morris R.....	256, 277
Peng, Alfred T. C.....	275	Pons, Jr., Eduardo R.....	256, 277	Rappaport, Sydney C.....	298
Penn, Richard D.....	257	Ponticorvo, Laura	276	Rapplepe, Willard C.....	274
Penner, Joseph A.....	255, 276	Pool, J. Lawrence.....	242, 254, 274	Rapport, Maurice M.....	275, 286
Pepper, Bertram	288	Poppers, Paul J.....	254, 275	Raskin, Raymond	287
Pereira, Gerard P.....	274	Porter, Milton R.		Rasweiler, IV, John J.....	274
Perel, James M.....	286		243, 251, 264, 270, 292	Rausch, Paul G.....	257
Perera, Charles A.....	254	Porter, Jr., Robert J.....	264	Raynor, Richard B.....	257, 279
Peretz, David	262, 287	Porter, Vincent	293	Reback, Samuel	258
Perkins, Marvin E.....	290	Portnoy, Stephanie	287	Redler, Lance D.....	259
Perkins, Ralph L.....	290	Portway, Thomas W.....	298	Redmond, Geoffrey P.....	261
Perlman, Arthur M.....	288	Porzio, Raymond J.....	263	Reed, David	263
Perry, Richard H.....	290	Poslusny, Elsa	280	Reemtsma, Keith	
Person, Ethel	287	Post, Seymour C.....	262, 286		242, 263, 269, 270, 292
Person, Philip	272, 299	Postley, Jr., John E.....	257	Reese, Algernon B.....	254
Pertchik, Alan	258	Potter, Guy D.....	263, 291	Reeves, John R.....	255
Perzin, Karl	260, 283	Potter, Harry R.....	262, 288	Regalado, Laurencia B.....	291
Pessar, Linda	263	Potters, Milton	300	Regan, Ellen F.....	259, 269, 282
Peters, Joseph P.....	290	Pourfar, Mohamad	261, 285	Regenie, Sandra J.....	280
Peters, Jr., Theodore.....	276, 278	Powers, Edward W.....	264	Reibeisen, Joseph	274
Peterson, Ann S.....	268, 269, 277	Prager, Kenneth M.....	257	Reibel, Stephen P.....	262, 287
Peterson, Barbara A.....	281	Prasad, Madduri D.....	265	Reichman, Lee B.....	278
Petti, Michael J.....	256	Prescott, Kathryn F.....	262, 286	Reiffel, James A.....	242, 257
Pettit, Helen F.....	280	Presseller, Stephanie	292	Reifsnnyder, David N.....	290
Petzoldt, Richard L.....	259	Presser, Harriet	269, 289, 294	Reilly, Edith B.....	256, 277
Pezzimenti, John F.....	257	Pressman, Barry D.....	263	Reilly, James A.....	263, 291
Phanor, Gilbert	275	Preston, Hugh S.....	276	Rein, Joel M.....	264
Phillips, Gerald B.....	256, 278	Price, Bruce A.....	290	Reiser, Howard	258
Phillips, Louise L.....	278	Price, Jr., John B.....	264, 292	Reisner, Edward H.....	279
Phillips, Maurice S.....	298	Prichard, Elizabeth R.....	277	Reiss, Robert M.....	259, 282
Phillips, Neil B.....	265	Priebe, Cedric J.....	293	Relland, John Y. M.....	293
Phillips, Percival B.....	289	Primack, Marshall	256, 277	Relland, John I.....	264
Photos, Constantine	294	Priestly, Joseph	265	Renert, William A.....	263
Pianpiano, Joseph A.....	298	Probst, Theodore D.....	264	Renner, Robert	300
Pico, Jr., Guillermo	259	Prouty, Richard R.....	278	Rennert, Morton C.....	272, 299
Pierre-Louis, Jeany	255	Provine, Martha M.....	261	Rettig, Arthur	264
Pierson, Anne B.....	258, 281, 294	Prudden, John F.....	264, 292	Reuben, John P.....	280, 286
Pierson, Jr., Richard N.....	256, 279	Pua, Estella K.....	255	Reyes, Francisco	258
Pietri, Raul	268	Puchner, Peter J.....	264, 293	Reyes, Rodolfo L.....	263, 292
Pine, Michael	257	Pulkabek, Peter S.....	294	Reynolds, Ralph X.....	294
Pines, Kermit L.....	256, 277	Pulrang, Stanford	264, 294	Reynolds, William V.....	283
Pinkernell, Bruce	278	Putignano, Joseph D.....	294	Reza, Robert J.....	257
Pinkett, Marcia L.....	290	Putney, Frederick B.....	268, 269, 270	Rhee, Sang C.....	258

PAGE	PAGE	PAGE
Rheingold, Stephen R.....256, 277	Rosenthal, Sara G.....257	Sanger, Bertram J.....256
Rice, Haynes .....269	Rosmaita, John S.....261, 285	Sanger, Grant .....264, 292
Rice, Margaret M.....261, 285	Rosner, William .....278	Sanger, Sirgay .....288
Rice, Robert W.....274, 282	Ross, Samuel M.....285	Sank, Diane .....288
Richards, Dickinson W. 254, 274, 278	Rossi, Harald H.....291	Santomauro, Anthony G.....258
Richards, Keith C.....263	Rosso, Pedro .....289, 295	Santora, Jr., Philip J.....300
Richards, Mary R.....285	Roswell, Charles G.....289	Santulli, Thomas V.....264, 292
Richards, Roderick C.....261, 284	Roth, Joel .....260	Saren, Martin .....289
Richart, Ralph M. 260, 281, 283, 294	Rothenberg, Fred .....255, 298	Sargis, Nancy M.....269, 280
Richman, Steven D.....263	Rothermel, Joel E.....259	Sarkisian, Sarkis S.....284
Richter, Ralph W.....258, 280	Rothman, Lewis M.....263	Sarlin, M. Bruce .....262, 287
Riely, Caroline A.....257	Rothner, A. David .....258	Saroff, Alan .....257, 285, 293
Rifkind, Richard A. 255, 269, 270, 276	Rothschild, Carl .....276	Satran, George .....262, 288
Rigal-Lizardi, Rene R.....255	Rothstein, Arnold M.....262, 287	Saur, David P.....258
Ripp, Norbert .....298	Rottenberg, Louis A.....263, 291	Savadore, Robert F.....263
Risk, Abraham .....281	Routenberg, Robert W.....263	Savetsky, Lawrence .....260, 283
Rittler, M. Catherine.....282	Rourke, Anthony J. J.....290	Savidge, G. Paul.....258
Rivlin, Richard .....256, 277, 295	Roven, Robert B.....256, 279	Savin, Michael B.....299
Rizkallah, Tawfik H.....282	Royster, Thomas S.....293	Savitsky, Elias .....287
Robbins, Phyllis .....263	Rozen, Jack H.....255, 276	Sawyer, Wilbur H.....268, 269, 285
Roberts, Elliott C.....290	Rubenstein, Allan .....258	Scarff, John E.....254, 274
Roberts, Lloyd .....284	Rubenstein, Marc .....258	Scarff, Timothy B.....257
Roberts, Myron S.....242, 264, 293	Rubin, Marvin V.....299	Scarola, John M.....300
Roberts, Theophilus .....284	Rubins, Louis I.....300	Schachter, David .268, 269, 270, 286
Robinson, Carol .....287	Rubinsztain, Rosalinda . . .261, 285	Schachter, Meri .....263
Rochester, Dudley F.....256, 278	Rudel, Rita G.....280, 286	Schaeffer, Morris .....290
Rodescu, Mauriciu .....283	Rudd, Lucia .....285	Schaffeld, Henry G.....278
Rodgers, James B.....293	Rudensky, George .....298	Scharer, Lawrence .....278
Rodgers, John M.....256, 278	Ruderman, Howard J.....299	Scharf, Robert D.....288
Rodgers, Reginald C.....291	Rudin, Leonard .....265	Schear, Myrna J.....258, 280
Rodgers, Terry C.....262, 287	Rudko, Andrew D.....276	Scheimberg, Bernardo S.....288
Rodrigues, Louis .....261, 285	Rush, David . . .261, 284, 289, 295	Schein, Jonah W.....263
Rodriquez-Martinez, Frank . . .261	Rusk, Gary .....263	Scheyer, Barbara J.....280
Roels, Dorothy .....289	Russell, Maurice V.....290	Schick, Alfred .....262
Rogatz, Peter .....290	Russell, Theresa E.....290	Schick, Robert W.....293
Rogers, Charles A.....298	Rutschmann, Jacques .....286	Schiff, Robert N.....300
Rogers, Constance .....289	Ryan, James H.....262, 286	Schiffman, Bernard M.....290
Roizin, Leon .....283, 286	Ryan, Stephen .....284	Schiller, Claire .....292
Roman, Jr., Stanford A. . .256, 278	Ryder, Charles T.....259, 269, 282	Schilling, Fred J.....279
Romas, Nicholas A.....264, 293	Saba, Rosaly .....255	Schimpeler, Suzanne M.....281
Romney, Benjamin M.....257	Sabbia, Richard F.....284	Schisa, Esther A.....289
Rose, Harold P.....300	Sachs, Howard .....285	Schlaeger, Ralph G.....263, 291
Rose, Harry M. . .242, 254, 269, 271	Saenger, Gerhart H.....289	Schlesinger, Edward B. . .257, 279
Rosen, Albert P.....261, 284	Safian, LeRoy S.....291	Schlom, Jeffrey .....276, 294
Rosen, David L.....277	Sagman, David L.....258, 280	Schmidt, Donald H.....256, 277
Rosen, Lawrence S.....276	Sahagian-Edwards, Alex . . .277	Schneider, Jurg A.....285
Rosen, Michael R.....278, 285	Sahler, Otto D.....291	Schneider, Louis .....256
Rosen, Moshe .....284	Saint-Amand, Nathan E. . .285	Schoener, Bernard B. 262, 268, 269, 286
Rosen, Tove .....261	St. John, Fordyce B. .242, 254, 274	Schoenfeld, Harvey .....290
Rosenberg, Arnold .....255, 299	Sala, Raul P.....292	Schoenfeld, Helene .....287
Rosenberg, Frederic R.....255	Salanitre, Ernest . . .254, 269, 275	Schoenfeldt, Richard S.....258
Rosenberg, Stephen N.....290	Salcman, Michael .....257	Scholz, Peter M.....286
Rosenberger, John W. . .262, 288	Saldanha, Victor F.....277	Schomer, Jesse .....262, 286
Rosenberry, Terrone L. . .275, 280	Salenger, Gary .....255	Schore, Arthur .....262
Rosenfeld, Barbara R. . .262, 287	Salkind, Albert .....299	Schrag, Peter E.....256, 277
Rosenfeld, Eugene D.....289	Salvatore, Anthony J. . .254, 275	Schreiber, Martin .....287
Rosenkranz, Herbert S. . .279	Salvatore, Joseph E.....282	Schreibman, Stephen .....257
Rosenstein, Bernard .....257	Salzinger, Kurt .....287	Schriever, Henry G.....284
Rosenstein, Solomon N. 255, 271, 272, 299	Salzinger, Suzanne .....287	Schroff, Julian .....299
Rosensweig, Norton S. . .256, 279	Samios, Nicholas . . .262, 287	Schube, Daniel D. . .255, 299
Rosenthal, Mitchell S.....288	Sampath, Angus C. . .279, 284	Schucman, Helen .....286
	Sananman, Michael L. . .258, 270	Schuker, Eleanor S. . .262
	Sanders, Saul L. .255, 265, 269, 276	Schullinger, John N. .264, 269, 292
	Sane, Paul .....263	Schulman, Jay .....288

	PAGE		PAGE		PAGE
Schulman, Norman	263	Sheldon, Paul B.	256	Slater, Lewis M.	256, 278
Schultz, Bonita P.	281	Shelley, Edward M.	287	Slatkin, Meyer H.	255, 276
Schulze, Jr., Robert A.	257	Shelly, Eleanor V.	292	Slepian, Jacob Z.	260
Schutz, Gunther A.	294	Shelton, Marvin L.	259, 282	Slevin, John J.	257
Schvey, Malcolm H.	260, 269, 283	Shen, Edith	261, 285	Sloan, Lawrence W.	242, 254, 274
Schwartz, Bernard S.	263	Shen, Shih-Chang	274	Slovits, Thomas	263
Schwartz, Herman	254, 275	Sheng, Kung-Tso	261, 285	Smelser, George K.	269, 274, 282
Schwartz, Howard	290	Shepardson, Jr., Robert M.	278	Smith, Alan DeForest	242, 254, 274
Schwartz, Iris W.	275	Sheps, Jack	288	Smith, Arthur M.	264, 293
Schwartz, Miles J.	279	Sher, Paul	283	Smith, David J.	271, 272, 275, 298
Schwartz, Murray	255, 299	Sherman, Warren T.	278	Smith, David M.	259
Schwartz, Robert M.	285	Shettles, Landrum B.	258, 281	Smith, Frank R.	256, 277
Schween, Peter-Heinrich G.	288	Shich, Stephanie	275	Smith, Gilbert P.	254, 298
Schwob, Marianne	285	Shiller, Jack G.	261, 284	Smith, Jr., James C.	263
Sciarra, Daniel	242, 257, 279	Shim, Yun	263	Smith, Jeanne A.	278
Scimshaw, Susan	294	Shimmel, Julia	294	Smith, John E.	277
Scott, Headley	291	Shimomura, Seiichi	279	Smith, Kendon W.	262, 287
Scrivani, Steven S.	255, 298	Shin, Woo-Yung	260	Smith, Martin DeForest	256
Scudder, John	264	Shin, Yong H.	261	Smith, Mary V.	280
Sealey, Jean E.	277	Sholem, Steven L.	265	Smith, William H.	261
Seaman, William B.	242, 263, 269, 291	Shookoff, Howard B.	256, 289	Smith, William M.	275
Searles, Harold F.	288	Shore, Arthur	287	Snow, William B.	254, 274
Sebrell, William H.	274, 290, 295	Sia-Kho, Edwina S.	255	Snow, William H.	285
Seegal, Beatrice C.	274, 279	Sian, Corazon S.	284	Snyder, Arthur I.	256, 277
Segal, Martin E.	290	Sibulkin, David	255, 276	Snyder, Joseph E.	251, 290
Seide, Mathieu A.	284	Siegal, Charles	262, 287	Snyder, Perrin B.	293
Seidel, Albin R.	254	Siegel, Harriet A.	261	Snyder, Ralph W.	284
Seiden, Margaret R.	258, 280	Siegel, Israel	279	Sobel, Harold J.	283
Segovia, Jorge	290	Siegel, Kenneth L.	300	Soley, Max	256
Self, Edward B.	264, 269, 292	Siegel, Morton R.	291	Solimene, Alfonso	274
Seligman, Morton J.	261	Siegman, Athalia E.	290	Solomon, Charles S.	298
Selleck, Nathaniel	256, 277	Sigelman, Jesse	259	Solomon, Marvin	299
Sencer, David J.	290	Sigler, John K.	259	Sommers, Sheldon C.	283
Seneca, Harry	264, 293	Sikes, Ralph F.	289	Sorabella, Philip	263
Senyszyn, John J.	263, 291	Silbermann, Maximilian	258	Sorger, Martin L.	259, 282
Sepowitz, Alan H.	257	Silbert, Paul J.	258	Soricelli, David A.	298
Settle, Kenneth M.	261	Silbert, Robert	287	Soriero, Olive	258
Severinghaus, Aura E.	274	Sillman, Jane S.	257	Sotelo, Julio E.	256, 277
Severino, Lawrence J.	258, 281	Silva, Fred G.	260	Sours, John A.	262, 287
Sewell, Granville H.	289	Silva-Hunter, Margarita	269, 276	Southam, Anna L.	281
Shaari-Tehrani, Mehdi	283	Silver, Carol D.	257	Southern, Darrell L.	261
Shaderowsky, Lawrence	287	Silverman, Joseph A.	261, 269, 285	Southworth, Hamilton	242, 243, 254
Shah, Narayan R.	261, 285	Silvers, Herbert F.	300	Spady, Frieda H.	263
Shahidi, Azra	279	Silverstein, Ellen F.	263	Spain, David	284
Shain, Arthur	300	Silverstein, William H.	298	Spalding, Charles F.	287
Shainess, Natalie	288	Simbonis, Stanley S.	283	Spalter, Harold	259, 282
Shalsha, Lilli C.	262	Simmons, Eldra	281	Sparks, Carlton A.	298
Shanahan, Sheila A.	261	Simon, Gilbert	243, 261, 285	Speck, William T.	261
Shands, Harley C.	288	Simon, Jane	260	Spector, Abraham	282
Shapiro, Daniel	286	Simon, Lawrence F.	293	Spector, Sidney	275, 285
Shapiro, Irving S.	289	Simpson, Elda	261	Spedaliere, Carmine	281
Shapiro, John H.	288	Simpson, George	288	Speert, Harold	258, 281
Shapiro, Joseph S.	255, 276	Simpson, Lance L.	269, 285, 286	Speller, Marsha	263
Shapiro, Lewis	255, 276, 283	Singer, Alfred	257	Spencer, Vernon F.	289
Shapiro, Robert	287	Singer, Barry L.	288	Sperry, Warren M.	274
Shapiro, Sam	290	Sinnette, Calvin H.	285	Spiegel, Herbert	262, 286
Sharma, Pradcep	261, 285	Sinton, William A.	259, 282	Spiegelman, Sol.	269, 276, 294
Sharpe, Lawrence	286	Sioussat, Robert S.	278	Spitz, Henry I.	262, 288
Shattan, Boaz M.	255, 299	Siris, Ethel S.	257	Spitzer, Robert	286
Shaver, Joyce C.	256, 278	Siris, Samuel G.	263	Spodek, Marvin	299
Shaw, Thomas E.	264, 293	Sirmans, Meredith	258, 281	Spotnitz, Henry	264
Shaw, William I.	291	Sitarz, Anneliese L.	261, 284	Sprague, David H.	255
Shechy, Thomas E.	299	Skilbred, Lars A.	259, 282	Sprinson, David B.	275
Sheets, Sarah L.	280	Skogerson, Lawrence E.	275	Sprunt, Katherine	260, 284
		Slanetz, Charles A.	264, 293	Srinivasan, Balachandran	259

PAGE		PAGE		PAGE	
Brinivasan, Dorothy	276	Strauss, Raymond B.	260, 283	Teng, Clarence	289
Brinivasan, Parithychery R.	275	Strauss, Robert A.	260	Tennyson, Virginia M.	280, 283
Brole, Leo	286	Stravrianopoulos, Joannis G.	276	Terada, Masaaki	276
Bühl, Eva B.	255, 276	Strife, II, Peter H.	300	Terenzio, Joseph V.	290
Bühl, Theodore J.	256, 278	Strika, Gerda H.	263	Terenzio, Peter B.	269, 299
Callone, Frank	287	Stroh, Edward	272, 299	Terestman, Nettie	287
Cams, Ulrich	265	Struening, Elmer L.	289	Terry, Jr., James H.	293
Canek, Albert	260	Stumpf, Harry H.	284	Terzakis, John A.	284
Canekwick, Walter R.	261, 285	Stutzman, Vernon C.	290	Thetford, William N.	286
Canley-Brown, Edward G.	293	Su, Philip	258, 280	Thieman, Philip W.	264, 293
Canon, Robert A.	264	Subramaniam, Arambi P.	294	Thomas, III, Henry M.	256, 257
Can, Raymond S.	261	Suciu-Foch, Nicole	293	Thomas, Samuel F.	258, 280
Can, Richard B.	293	Sudasna, Sudhee	259	Thomas, Jr., William C.	289
Canman, Sidney	258	Sugawa, Isao	259	Thompson, Errol A.	283
Can, Norman J.	255	Suh, Han Kyu	257	Thompson, Peyton	263
Can, George	291	Sullivan, Stuart F.	254, 275	Thomson, Gerald E.	256, 278
Can, William H.	256, 278	Sum, Grace C. K.	287	Thorne, Irving J.	293
Can, Robert D.	284	Surer, Fouad	281	Thorner, Richard E.	257
Can, Carl N.	261, 284	Susser, Mervyn W.	289, 295	Thornhill, Herbert L.	263, 269, 292
Can, Charles M.	243, 258, 281	Sutton, Samuel	286	Thyng, Frederick	263
Can, William	298	Svahn, David S.	278	Tierney, Mary B.	261
Can, Anna	281	Swana, Fidel	263	Tietjen, George W.	264
Can, Arthur	262, 287	Swann, Alan C.	257	Tietze, Christopher	281
Can, Jeffrey	256, 277	Sward, Kathleen M.	291	Tobin, Michael	287
Can, Robert M.	257	Swarm, Richard L.	283	Todd, Caron	290
Can, Sanford W.	262, 287	Sweeney, Eugene W.	255, 276	Todd, James S.	264, 293
Can, Stephen D.	299	Sweeney, Sister Margaret M.	290	Todd, W. Duane	242, 258, 269, 281
Can, Zena A.	289	Sweeting, Joseph G.	256, 268, 269, 277	Tokumaru, Tadasu	279, 282
Canberg, Sidney	280	Swordloff, Bluma	286	Tomashefsky, Philip	283, 293
Caner, Alfred	256, 277	Swordlow, Paul H.	279	Tornberg, David	270
Caner, Charles	256, 277	Swift, Lucy H.	261, 285	Tornusciolo, Alfonso	262
Caner, Jerome	287	Symonds, Jr., Francis C.	264, 269, 292	Totero, Nestor J.	288
Caner, Nicholas V.	278	Szabo, Nicholas A.	257	Tovell, Harold M. M.	281
Caneglass, Kenneth M.	264	Szalita, Albert B.	286	Townsend, Eleanor B.	290
Can, Theodore R.	291	Szmarag, Ruth	262, 287	Tozzo, Pellegrino J.	294
Can, Kenneth	256, 278	Szmuness, Wolf	290	Tracht, Myron E.	283
Can, Aaron	287	Taggart, John V.	255, 269, 271, 276, 286	Treder, Joanna	255
Can, Daniel N.	262	Talarico, Rudolph D.	294	Trei, Alice R.	292
Can, David	286	Talbott, John A.	288	Tretter, Patricia	263, 291
Can, Diane	300	Talwar, Prem	294	Tretter, Wolfgang	258, 281
Can, Lenore O.	294	Tamerin, Joseph A.	293	Trichter, Samuel	290
Can, Morton J.	255, 299	Tamir, Hadassah	276, 287	Trifunao, Natalie P.	276
Can, Irwin	299	Tamlyn, Thomas T.	279	Triner, Lubos	255, 275
Can, Lawrence E.	293	Tanenbaum, Stuart W.	269, 279	Tripi, Joseph E.	264
Can, Stuart S.	260, 269, 285	Tannenbaum, Myron	260, 283, 293	Trokel, Stephen L.	259, 282
Can, David W.	290	Tapley, Donald F.	255, 268, 269, 270, 276	Truccone, Nestor	261
Can, Philip R.	278	Tarcia, Carol R.	290	Truppin, Ada	285
Can, David	261, 285	Tardo, Carmela	258	Tsang, Hing-Ling	261
Canfield, Frank E.	242, 243, 259, 269, 270, 282	Tardy, Walter	263	Tsueda, Kentaro	275
Can, Walter U.	265	Tarlov, I. M.	280	Tucci, Paul	294
Can, Harold	291	Tarshis, Julius	299	Tucek, Charles O.	263
Can, Richard J.	256, 277	Tator, Robert B.	278	Tuchman, Walter	287
Can, Herbert C.	283	Taubenhaus, Leon J.	290	Tucker, William M.	263
Can, Cornelis L.	286	Taxin, Richard N.	263	Tuckman, Alan J.	287
Can, Frances A.	298	Taylor, Jr., Howard C.	242, 254, 274	Tueting, Patricia A.	288
Can, Richard A.	290	Taylor, James L.	257	Turgeon, Livia K.	290
Can, J. Gilbert	254, 275	Taylor, Lawrence E.	293	Turino, Gerard M.	255, 276
Can, Michael H.	262, 287	Taylor, Reginald	286	Turkel, Ann	300
Can, Robert	292	Techo, Thomas B.	278	Turnauer, Elizabeth F.	261, 285
Can, Aluizio R.	261			Turner, Naomi L.	263, 292
Can, Marcia L.	281			Tuul, Aino	275
Can, Hilda G.	255, 276			Tyson, Cornelius J.	256, 277
Can, Carl S.	261, 285			Tytun, Alex	290

	PAGE		PAGE		PAGE
Udenfriend, Sidney	276	Vulliemoz, Yvonne	275	Weitzen, Hyman G.	258, 280
Udel, Melvin M.	288	Wagers, Lawrence T.	255	Wells, Winfield J.	264
Ueda, Gaiko	284	Wagner, Bernard M.	283	Welsch, Exie E.	262, 287
Ufford, Elizabeth	261, 285	Waldron, Robert L.	263, 291	Wenk, Robert E.	284
Ulan, Martin S.	290	Walker, Howard Lee	258	Wermer, Paul	256
Umans, Robert	300	Walker, Thornton S.	278	Werne, Benjamin	290
Umhey, Jr., Charles E.	264, 293	Wallace, Claudine Y.	285	Werner, Sidney C.	255, 277
Umhey, James A.	265	Wallace, Robert E.	289	Wertheim, Arthur R.	255, 269, 276
Underbrink, Alan G.	291	Wallace, Ronald	256, 278	Wertlake, Paul T.	284
Untereker, John J.	292	Waller, Riely W.	281	Wesley, James E.	291
Usami, Shunichi	286	Walsh, Robert F.	300	Wessinger, James B.	259
Uson, Aurelio C.	264, 293	Walter, Joseph F.	263	West, John P.	293
		Waltner, Jules G.	259, 283	West, Robert	261, 285
Vakili, Bahman F.	265	Walzer, Richard A.	255, 276	Westerhoff, Jr., Peter D.	260, 283
Valensi, Vincent	291	Wandel, Thaddeus L.	259, 282	Wethers, Doris L.	261, 285
Vanacek, Russell J.	299	Wang, Chung C.	290	Weyman, Donald R.	263
Van Alstine, Helen	256, 277	Wang, Hsueh-Hwa	285	Wharton, Ann M.	281
Van Alstine, Susana L.	288	Wang, Shih-Chun	285	Wharton, Ralph N.	262, 286
Van der Vynckt, Susan	294	Warburton, Dorothy	276	Wheat, William D.	288
Vande Wiele, Raymond L.		Ward, Joseph N.	294	Wheaton, Jr., Earl A.	256, 277
242, 243, 258, 269, 270, 281, 294		Warren, Lucy D.	280	Wheeler, Edward M.	282
Vandiveer, Janet C.	292	Warren, Michelle	258	Wheeler, Maynard B.	259
Van Dyke, Frank W.	289	Warren, William A.	276	Wheeler, Maynard C.	254, 274
Van Etten, Royal C.	254	Wasserman, Bernard H.	299	Wheeler, Robert C.	261, 285
Van Itallie, Theodore B.		Wassermann, Norbert	279	Whelan, Charles A.	263
256, 278, 295		Waterson, K. William	255, 276	Whetsell, William	260
Van Ness, Edward H.	290	Watkins, Elizabeth B.	261, 285	White, Eric S.	259
Van Praagh, Ian G.	282	Watkins, Melvin B.	259	White, Geoffrey G.	259
Varma, Andre A. O.	289	Watson, Benjamin P.	242, 254, 274	White, John J.	293
Vastola, James W.	294	Wax, Sandor H.	264, 293	White, III, Robert R.	294
Vaughan, Jr., E. Darracott	257, 277	Weber, Anne-Marie	260	Whitfield, Jr., Randolph	259
Vaules, David W.	278	Weber, Collin J.	264	Whitfield, Stanley	283
Veenema, Ralph J.		Weber, John J.	286	Whitlock, Robert T.	256, 277
264, 268, 269, 293		Webster, Jerome P.	254, 274	Whitman, Clifford LeR.	299
Veitch, Sidney	255	Wechsler, Michael D.	265	Whitney, Harold H.	257
Velez, Ramon	257	Weekes, Francis	275	Whittemore, Anthony	264, 293
Venuto, Ralph J.	259	Weekes, Noel	284	Whitten, William W.	261, 285
Veprak, Leos G.	294	Wei, Wellington	263	Whittier, John R.	288
Verdisco, Loretta	280	Weider, Arthur	288	Wichern, Walter A.	269, 295
Verlin, William A.	299	Weil, III, Richard	264, 292	Wickham, Robert D.	294
Vero, Nicholas A.	300	Weiler, Martin E.	287	Widner, Geraldine A.	290
Verosky, Mariagnes	275	Weinberg, Barry M.	298	Widrow, Maxwell	300
Vestergaard, Per B.	288	Weinberg, Daniel	285	Wiedel, Philip D.	264, 269, 270, 295
Vicale, Carmine T.	257, 279	Weinberg, Sidney B.	290	Wiederhorn, A. Roger	265
Vicens, Cristobal A.	256, 277	Weidenbacher, Richard L.	263	Wigger, H. Joachim	260, 285
Victoria, Andre	259	Weinberger, David S.	288	Wilcox, Daniel A.	26
Viederman, Milton	262, 287	Weiner, Louis	290	Wilcox, Jr., Herbert B.	256, 277
Villafuerta, Aurora D.	280	Weinstein, Ephraim	300	Wilder, David	287
Villaluz, Carmen M.	255	Weinstein, I. Bernard	256, 277, 294	Wildman, Joseph M.	257
Villanueva, Rey O.	255	Weinstein, Joel D.	259, 282	Wilens, Sigmund L.	254, 28
Vinci, Joseph M.	257	Weinstein, Samuel	263	Wiley, Bruce E.	263, 29
Vinkka, Heli	299	Weintraub, Gerald	278	Wilkie, George H.	262, 28
Vita, Martin B.	261, 285	Weisberg, Leon	258	Wilking, Leo, F. J.	261, 28
Vitikainen, Kari	264	Weiss, Arthur B.	300	Wilking, Virginia N.	28
Vogel, Henry J.	279, 283	Weiss, Benjamin	275, 286	Willetts, Arthur T.	264, 29
Vogel, Howard B.	298	Weiss, Harvey J.	278	Williams, Alfred J.	28
Vogel, Ruth H.	283	Weiss, Jay	300	Williams, Arthur C.	29
Von Bockstaele, Pierre G.	293	Weiss, Melvin B.	256, 277	Williams, Daniel	26
von Hofe, Frederick H.	261	Weiss, Richard W.	263	Williams, Gail S.	25
von Micsky, Lajos I.	282	Weiss, Robert M.	285	Williams, Herbert	29
Voorhees, Jr., Arthur B.		Weissbach, Arthur	276	Williams, Hugh R.	28
242, 264, 292		Weissbach, Herbert	276	Williams, Michael D.	27
Vosburgh, Gilbert J.	258, 281	Weissberg, Josef H.	262, 287	Williams, Roger W.	28
Vratsanos, Spyros M.	279, 299	Weissman, Jack B.	257	Williamson, Susan W.	258, 265, 28
				Willson, Nicholas J.	260, 28

PAGE		PAGE		PAGE	
Wilner, George D.....	283	Woodman, DeGraaf	254	Yue, Shyh-Jong	263, 292
Wilson, Agnes G.....	261	Worlund, Richard L.....	259	Yum, Jung Hae.....	288
Wilson, Frank R.....	258	Wotman, Stephen	271, 300		
Wilson, John M.....	293	Wray, Edwin O.....	280	Zablow, Leonard	280
Winbury, Martin M.....	285	Wright, Myron	279	Zagon, Lewis	298
Windrow, Mary E....	242, 251, 280	Wrubel, Carolyn	281	Zakhary, Reda A.....	255
Winick, Myron	260, 269, 284, 295	Wu, John C.....	284	Zanes, Anne S.....	290
Winikus, Winifred	286	Wu, Ruey R.....	291	Zawadsky, Joseph P.....	259, 282
Winshell, Elaine P.....	277	Wung, Jen Tien.....	255	Zegarelli, David J.....	300
Winslow, T. Scudder.....	293	Wylie, Robert H.....	254	Zegarelli, Edward V.....	255, 271, 272, 300
Winters, Robert W....	260, 284, 295	Wynder, Ernest L.....	289	Zeidenberg, Philip	262, 287
Wirostko, Emil	259, 282			Zeisler, David	300
Wise, Carl R.....	243, 251, 256, 270, 277	Yahr, Melvin D.....	243, 257, 268, 269, 270, 279	Zelko, Russell R.....	259
Wishik, Samuel M.....	289	Yamaguchi, Nobuo	294	Zemmering, Paula E.....	276
Wit, Andrew L.....	285	Yang, Chen-Ping	255	Zengo, Albert	300
Witkovsky, Paul	282, 286	Yang, Joseph	255	Zerden, Edward	300
Witowski, John J.....	263	Yaniv, Auraham	294	Ziffer, Herman	278
Wolarsky, Evan V.....	264	Yannopoulos, Kaity	284	Zikria, Bashir A.....	264, 269, 292
Wolf, Abner	254, 274, 280, 284	Yeaw, Ralph C.....	264, 293	Zimberg, Sheldon	288
Wolf, Charles E.....	254, 275	Yeh, Ming Neng.....	258, 281	Zimmering, Paula	281
Wolff, James A.....	242, 260, 284	Yeoh, Chin Bor.....	293	Zimmerman, Earl A....	258, 280, 294
Wolff, Marianne	260, 283, 292	Yergan, Charles M.....	278	Zinsser, Hans H.....	264, 293
Wollman, Arthur	265	Yergan, Jr., Max.....	293	Zipper, Howard D.....	260, 283
Wolmer, David H.....	299	Yoon, Hong C.....	254, 255	Zitzmann, Eric K.....	259, 282
Wolpert, Arthur	263	Young, Jr., Alexander W....	255, 276	Zizmor, Jonathan	255
Won, Il Sung.....	255	Young, Stuart H.....	256, 278	Zorn, Jr., George L.....	264
Wong, Constance	255	Yu, Fu-Li	294	Zubin, Joseph	274, 288
Wood, Ernest H.....	263, 291	Yu, Ming Tsung.....	276	Zucker, Preston	261, 285
Wood, John A.....	256, 277	Yudelman, Ian M.....	257	Zugibe, Frederick T.....	284
Woodcock, Thomas M.....	257	Yudofsky, Stuart C.....	263	Zyroff, Jack	257, 263

Columbia-Presbyterian Medical Center



COLLEGE OF PHYSICIANS AND SURGEONS
Columbia University in the City of New York

PRESBYTERIAN HOSPITAL
Columbia University in the City of New York

SCHOOL OF DENTAL AND ORAL SURGERY
Columbia University in the City of New York



FIFTEENTH COMBINED ANNUAL REPORT
of the
COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York, N.Y. 10032



College of Physicians and Surgeons • Columbia University
in the City of New York

The Presbyterian Hospital in the City of New York

and

School of Dental and Oral Surgery • Columbia University
in the City of New York

December 31, 1973

This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who through their training are preparing to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 7,500 people who serve and study within the Hospital and College, who give life and breath to this concept.

“Those who serve” include every worker — professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

Contents

ORIGIN AND FUNCTIONS OF THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER	iii	REPORTS OF WOMEN'S AUXILIARIES	
REPORT OF THE CHAIRMAN OF THE BOARD		THE PRESBYTERIAN HOSPITAL IN THE CITY OF	
THE PRESBYTERIAN HOSPITAL IN THE CITY OF		NEW YORK	231
NEW YORK	1	Board of Women Managers, Babies Hospital .	232
REPORT OF THE PRESIDENT OF THE MEDICAL BOARD		Cribside Social Service Committee	233
THE PRESBYTERIAN HOSPITAL IN THE CITY OF		Neurological Institute Auxiliary	234
NEW YORK	5	Women's Auxiliary of the New York	
REPORTS OF THE VICE PRESIDENT FOR		Orthopaedic Hospital	237
HEALTH SCIENCES AND THE DEAN OF THE		Women's Auxiliary of the	
FACULTY OF MEDICINE		Presbyterian Hospital	238
COLLEGE OF PHYSICIANS AND SURGEONS	8	TRUSTEES AND COMMITTEES	241
REPORTS OF DEPARTMENTS AND SERVICES	27	Trustees of	
Anatomy	28	Columbia University in the	
Anesthesiology	31	City of New York	242
Biochemistry	36	Joint Administrative Board	243
Dermatology	41	Trustees of	
Human Genetics and Development	45	Columbia-Presbyterian Medical Center Fund,	
Medicine	52	Inc.	243
Microbiology	70	Trustees and Officers of	
Neurological Surgery	78	The Presbyterian Hospital in the	
Neurology	81	City of New York	244
Nursing	90	Committees of the Board of Trustees	246
Obstetrics and Gynecology	94	Medical Board	246
Ophthalmology	103	THE PRESBYTERIAN HOSPITAL IN THE CITY OF	
Orthopaedic Surgery	110	NEW YORK	249
Otolaryngology	116	Women's Auxiliaries	250
Pathology	118	Members of the Corporation	253
Pediatrics	129	Administrative Staff	255
Pharmacology	137	PROFESSIONAL STAFF	
Physiology	143	THE PRESBYTERIAN HOSPITAL IN THE CITY OF	
Psychiatry	148	NEW YORK	257
Public Health	158	Consultants	258
Radiology	166	Chiefs of Clinics	268
Rehabilitation Medicine	173	FACULTY OF MEDICINE	
Surgery	177	COLLEGE OF PHYSICIANS AND SURGEONS	
Urology	186	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	269
International Institute for the Study of		Officers of the Faculty of Medicine	270
Human Reproduction	192	Executive Committee of the Faculty	270
Institute of Cancer Research	197	Faculty Council of the Faculty of Medicine ..	270
Institute of Comparative Medicine	205	Academic Committees	271
Institute of Human Nutrition	206	Joint Committees of Faculty of Medicine	
Medical Library	210	and Professional Staff	
Center for Community Health Systems	214	of Presbyterian Hospital	272
Cancer Research Center	219	SCHOOL OF DENTAL AND ORAL SURGERY	
DENTAL AND ORAL SURGERY	225	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	273
REPORT OF THE		Officers of the Faculty	273
PUBLICATIONS OF MEMBERS OF THE DENTAL		Academic Committees	273
PROFESSIONAL AND ACADEMIC STAFFS	229	ACADEMIC STAFF	
		COLLEGE OF PHYSICIANS AND SURGEONS	
		COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	275
		Emeritus Officers	276

Contents—Continued

ACADEMIC STAFF

SCHOOL OF DENTAL AND ORAL SURGERY

COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK 299

Emeritus Officers 300

APPENDIX 303

THE PRESBYTERIAN HOSPITAL IN THE CITY OF

NEW YORK

Balance Sheet 304

Statement of Operating Revenues
and Expenses 306

Statement of Revenues and Expenses
and Changes in Unrestricted Fund Balances.. 307

Statement of Changes in
Restricted Fund Balances 308

Statement of Changes in Financial Position
of Unrestricted Funds 310

Notes to Financial Statement 311

Endowment Funds 313

Auditors' Opinion and
Report of the Auditing Committee 316

Group Retirement Plan 317

Statistics 318

THE WOMEN'S AUXILIARIES 320

THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER
FUND, INC. 324

THE ALUMNAE ASSOCIATION, SCHOOL OF NURSING . 327

ENDOWED BEDS AND ROOMS 328

INDEX TO PROFESSIONAL AND ACADEMIC STAFFS ... 337

Origin and Functions of the Columbia-Presbyterian Medical Center

The Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the hospitals and the University the members of the staffs of the hospitals are nominated by Columbia University, and teaching and research are conducted in all the hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institutions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons. The connection was only a nominal one, however,

until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928, the College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. As a part of the Columbia-Presbyterian Medical Center, it is housed in a seventeen story, fire-resisting, steel, brick and concrete building, each floor connecting with the wards and services of Presbyterian Hospital.

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The School of Dental and Oral Surgery

In September, 1916, students in dentistry were admitted to courses in Columbia University at the College of Physicians and Surgeons. On March 15, 1917, the Trustees of Columbia University established a School of Dentistry as of September 27, 1916, so that the conduct of courses from that date, as forming part of the work of the School, might be officially recognized. The School was to be established "upon university lines," meaning "a school the requirements for admission to which shall be the same as those for admission to the Medical School and whose students shall then pursue a four year course, the first two years of which will be almost identical with the first two years of the course of Medicine. The last two years would be given to special preparation for dentistry and dental surgery."

Temporary quarters were utilized on West 39th Street, and in 1920 a small building was erected adjacent to the entrance of the College of Physicians and Surgeons on West 59th Street in which instruction was carried on until the spring of 1923. In the course of that spring and summer, negotiations for the merging of the College of Dental and Oral Surgery with the Dental School of Columbia University were completed and, in September, 1923, the new institution became the School of Dental and Oral Surgery, established in the buildings of the

older private corporation on East 35th Street. On completion of the Medical Center in 1928, the School moved to its present quarters where it is adjacent to the basic science departments of the University, the Medical Library and Vanderbilt Clinic.

The School provides undergraduate instruction in dentistry and dental hygiene. Postgraduate courses in the specialties of dentistry and a master's degree in dental hygiene are offered. Clinics, open to the public, are conducted in all areas of dentistry and the Hospital Dental Service is staffed and maintained by the School.

The School of Nursing

The School of Nursing was founded in 1892 for the training of nurses. Since 1935, its educational program has been under the supervision of the Department of Nursing of the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University. A thirty-two month course in nursing is conducted, and graduates receive the degree of Bachelor of Science from Columbia University.

William Black Medical Research Building

The newest addition to the Columbia-Presbyterian Medical Center is the 20-story William Black Medical Research Building at 168th Street and Fort Washington Avenue. The building is now used exclusively for research with all departments of P&S expanding their present quarters. The building, dedicated January 3, 1966, was named for William Black, founder and Chairman of the Board of the Chock Full o' Nuts Corp. The financing of the building was made possible in part by a \$5,000,000 gift from Mr. Black to P&S.

Institute of Cancer Research

The Institute of Cancer Research of the Columbia University College of Physicians and Surgeons was established in 1909 with funds bequeathed to the University by George Crocker. It moved from its original quarters on 116th Street to the College of Physicians and Surgeons in 1938. The Francis Delafield Hospital later became the center of clinical and experimental cancer research at P&S. In 1967 a five-story research wing was added to the Delafield Hospital enabling the consolidation of all the laboratories of the Institute in one building. These laboratories now provide the means for extensive investigations of many aspects of cancer and for the postgraduate training of scientists in this field.

The Institute of Human Nutrition

The Institute of Human Nutrition was established in 1958 following the endowment of the R. R. Williams Professorship of Nutrition from the Williams-Waterman Fund. The principal objective of the Institute is to provide the specialized training necessary to combat and prevent the effects of malnutrition. Emphasis is placed on the training of medical students, physicians and biochemists. Degrees offered are the Master of Science in nutrition through the Faculty of Medicine and the Ph.D. in nutrition through the Graduate School of Arts and Sciences. The teaching and research program is organized around three divisions: the Division of Growth and Development, the Division of Nutrition and Metabolism, and the Division of Community Nutrition. Teaching and research facilities are located in the William Black Medical Research Building and at St. Luke's Hospital Center. In addition, the Institute maintains national and international ties with numerous medical schools and research centers.

International Institute for the Study of Human Reproduction

The International Institute for the Study of Human Reproduction was founded in 1965 with a grant from the Ford Foundation, later supplemented by one from the Rockefeller Foundation. Its primary purpose is to do research in the fields of biology, clinical investigation, and the social sciences relevant to the solution of the world population problem. A parallel objective is to study the many complications of the reproductive process affecting human welfare such as infertility, endocrine disorders, out-of-wedlock pregnancy, marital and other social problems. The Institute is now operating with four divisions: (1) biology and biochemistry, (2) clinical investigation, (3) demography, and (4) development and evaluation of family planning programs throughout the world.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for and includes all of the individual units described below. Mr. Augustus C. Long is Chairman of the Board of Trustees and Mr. A. J. Binkert is President.

The Hospital has an overall capacity of 1,490 beds. Its professional staff consists of 954 attending physicians, 293 residents and interns, and 9 visiting fellows, whose nominations to the staff of the Hospital are made by the College of Physicians and Surgeons of Columbia University.

Students from the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University, residents, interns, fellows, and students in various allied health programs use the Hospital's clinic facilities for their instruction. Some 140,000 patients a year are cared for in the hospitals, clinics and doctors' offices of the Presbyterian Hospital which consists of the following units:

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison Avenue and Park Avenue between 70th and 71st Streets. In 1911 the Presbyterian Hospital and Columbia University's College of Physicians and Surgeons entered into an agreement for coordinating the care of the sick with the education and research programs of the College. This was followed by an alliance agreement in 1922 which led to the Medical Center complex which opened in the fall of 1928 at its present location in Washington Heights. In 1943 Babies Hospital and Neurological Institute were consolidated with Presbyterian Hospital. In 1945 New York Orthopaedic Hospital was consolidated with Presbyterian Hospital. Presbyterian Hospital is the single largest hospital unit, having inpatient facilities for the services of Medicine, Surgery, Obstetrics and Gynecology, Urology, Otolaryngology, Dermatology and Orthopedic Surgery.

Babies Hospital

Babies Hospital was founded in 1887, and located at 657 Lexington Avenue (55th Street), and later moved to two houses at 56th Street and Lexington Avenue. In 1928 Babies Hospital moved to the Medical Center as a separate corporate unit which consolidated with Presbyterian Hospital in 1943. Babies Hospital, the Pediatric Unit, can accommodate 194 patients. A new fourteen story shell addition has been erected, six floors have been completed and the remaining eight floors are being completed in stages by priority of need. When completed the addition will provide modern patient areas, laboratories, classrooms and special care units.

Pediatric outpatient clinics are maintained in Vanderbilt Clinic. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

The Dana W. Atchley Pavilion

The Dana W. Atchley Pavilion, located on the corner of Fort Washington Avenue and 165th Street, provides facilities for 175 physicians to see ambulatory patients. The first six floors of this 14-

story building were occupied in December, 1969. The remaining shell floors are for future development.

Harkness Pavilion

Harkness Pavilion provides in-hospital accommodations for 324 private and semiprivate patients.

The Edward S. Harkness Eye Institute

The Edward S. Harkness Eye Institute, opened in 1933, has a capacity of 100 beds and complete facilities for the medical-surgical treatment of patients with diseases of the eye. In October 1969, a new wing was opened, which provides research facilities and ophthalmologic outpatient facilities.

The Neurological Institute

The Neurological Institute, founded in 1909, was one of the first nongovernmental hospitals in this country for the treatment of diseases of the nervous system. It was originally located on 67th Street and Lexington Avenue, moved to the Medical Center in 1929, and was consolidated with Presbyterian Hospital in 1943, making possible a broad basic program of teaching and research in neurology and the treatment of diseases of the nervous system. The Institute has a capacity of 250 beds, including 15 added in 1960 for psychiatric patients.

The New York Orthopaedic Hospital

The New York Orthopaedic Hospital was originally located at 420 East 59th Street, New York, N. Y. and was opened in 1866 largely because of the interest taken in the care of the crippled by Theodore Roosevelt, father of the President by the same name. In 1911 the first spinal fusion operation for Pott's Disease was performed by Dr. Russell A. Hibbs. Orthopaedic Hospital was consolidated with Presbyterian Hospital in 1945 and moved to the Medical Center in December 1950, where it has accommodations for 93 adults and 29 children. It now occupies the 5th floor of the Presbyterian Hospital building and the 5th floor of Babies Hospital, and additional facilities in Harkness Pavilion.

Radiotherapy Center

The Radiotherapy Center, one of the largest facilities for clinical research and x-ray treatment of cancer, was opened in 1966.

Sloane Hospital for Women

Sloane Hospital for Women was founded in 1886 and was originally located at 59th Street and Amsterdam Avenue. Sloane Hospital moved to the

Medical Center in 1928 as a unit of the Presbyterian Hospital. It now occupies three floors of the Presbyterian Hospital and one floor of Harkness Pavilion, providing inpatient facilities for 187 patients and 110 bassinets.

The J. Bentley Squier Urological Clinic

Squier Urological Clinic occupies the 10th floor of Presbyterian Hospital, with additional facilities available in Harkness Pavilion. It contains 67 beds for adults and 20 for children.

Vanderbilt Clinic

Vanderbilt Clinic, originally presented to Columbia University by the Vanderbilt family in 1888, moved to the Medical Center in 1928 as part of the Presbyterian Hospital. It is now the primary outpatient facility for all units of Presbyterian Hospital, averaging about 400,000 clinic visits each year. It is essentially a fully equipped outpatient clinic offering complete medical, surgical and specialty services. A modern emergency facility, staffed and equipped to deal with any medical or surgical emergency within the unit, was completed in 1973.

Other Patient Care Institutions Located at the Medical Center

The New York State Psychiatric Institute and Hospital, built and maintained by the State of New York, is a 174 bed hospital with provisions for the study and treatment of all types of psychiatric disorders.

The Francis Delafield Hospital, built and maintained by the City of New York, is a 261 bed limited general hospital with emphasis on the treatment and study of cancer.

The Washington Heights Health and Teaching Center was built and is maintained by the City of New York.

The Center for Community Health Systems

The Center for Community Health Systems is an interdisciplinary and interdepartmental activity of the Faculty of Medicine whose purpose is to enlist the substantial and varied resources of the University and its affiliated hospitals in a systematic attack on the problems of the organization and delivery of health care.

In 1970 the Faculty of Medicine decided that it should be involved to a greater extent in the problems of health care systems. Over the subsequent year, the structure and functions of the Center were planned and developed. Various academic disciplines and health care provider resources would be required to grapple with the complex problems of health care. It was also clear that many departments of the Faculty of Medicine and the University would welcome the opportunity to participate in health care research and development programs. The decision was made, therefore, that the Center should be interdisciplinary and interdepartmental.

The importance of community participation in the affairs of the Center was recognized from the beginning, and a number of mechanisms have been developed for involving community individuals and groups in planning and carrying out Center projects.

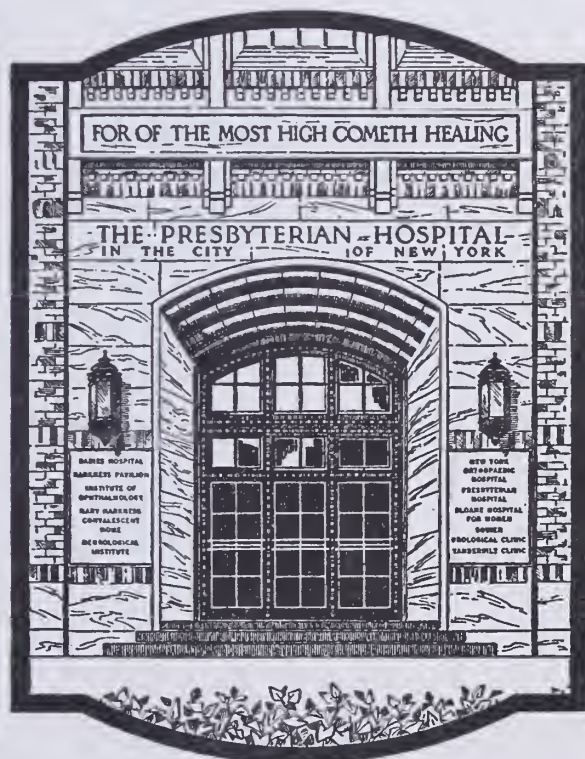
The Center has evolved in the direction of focusing on four kinds of problems: those having to do with ambulatory care in urban settings, such as upper Manhattan; health system problems relating to specific population groups, such as children, adolescents, the poor, and the elderly in upper Manhattan; the problems and possibilities of ambulatory care related to community hospitals in the United States; and more narrowly defined technological problems, such as expenditures on health care in New York City and queueing problems in ambulatory care.

The Columbia-Presbyterian Medical Center Fund, Inc.

The Columbia-Presbyterian Medical Center Fund, Inc. is a non-profit corporation, formed in 1959, to receive and allocate funds for the Development Program of renewal and expansion of facilities at Columbia University's College of Physicians and Surgeons and The Presbyterian Hospital. Its officers are elected as a Joint Board of Trustees from the Boards of Trustees of the University and Hospital. Gifts and grants to the Fund may be made for specific projects described in the Development Program literature, which is available on request, or they may be unrestricted, to be used by priority of need, as determined by the Joint Board of Trustees.

Report of the Chairman of the Board

The Presbyterian Hospital in the City of New York



Report of the Chairman of the Board of The Presbyterian Hospital for 1973

NINETEEN HUNDRED SEVENTY-THREE was a difficult year for hospitals throughout our country and The Presbyterian Hospital was no exception. On the positive side, our doctors, nurses and supporting staff continued to provide excellent medical care for its 140,000 patients; important new and improved clinical facilities were provided, and advanced treatment techniques continued to evolve from research carried out here and in other research centers. The Hospital provided 39,079 patients with 426,820 days of inpatient care, and there were 675,400 ambulatory-patient visits made to Vanderbilt Clinic and Doctors' Private Offices. On the negative side, costs continued to spiral and the Hospital's financial needs were greatly accelerated as inflation widened the gap between operating costs and revenues. An operating loss of approximately \$5,600,000 was incurred, an increase of \$3,300,000 over the 1972 loss. Contributions and endowment income available to support this deficit were insufficient and \$2,500,000 of the principal of the Hospital's endowment fund was liquidated to provide operating funds.

Hospital operating costs rose by \$7,503,019, compared with 1972, to \$92,932,831, of which \$64,279,700 was for payroll and employee fringe benefits. To meet the needs of new patient-care facilities, the personnel roster rose by 58, to a total of 5,537.

Approximately half of the visits to Vanderbilt Clinic in 1973 were almost completely covered by Medicare and Medicaid and the other half were charged according to a patient's ability to pay. As a result, this latter group of patients paid an average of less than \$6 each for 215,000 visits that cost the Hospital—including drugs, x-rays, laboratory tests and other ancillary services—more than \$34 a visit. As a consequence, the operating loss for Vanderbilt Clinic ambulatory-patient services totaled \$6,600,000. Every lead is continually being followed to find re-

imbursement funds to offset the costs incurred in the delivery of these essential community services—losses which cannot be absorbed indefinitely, if the Hospital is to maintain its high standards of medical care.

We are pleased to report that the Columbia-Presbyterian Medical Center Joint Development Program, announced in June 1973, is now gaining momentum under the leadership of Harold H. Helm and Robert D. Lilley, who serve as Chairman and Co-Chairman of the campaign to raise \$133,750,000 over a five year period, against which a total of approximately \$15,000,000 has now been received, including a gift of \$5,000,000 from The Commonwealth Fund. Mr. Helm is a Vice President of the Board of Trustees of The Presbyterian Hospital in the City of New York, and Chairman of the Executive Committee of Chemical Bank. Mr. Lilley is Alumni Trustee of the Board of Trustees, Columbia University, and President of the American Telephone & Telegraph Company. Approved Hospital projects in the program are:

- 1) Renovation and Expansion of Vanderbilt Clinic;
- 2) Modernization of Ward and Semi-Private Areas in The Presbyterian Hospital, The Edward S. Harkness Eye Institute and Neurological Institute;
- 3) New Central Laboratory Facilities to serve all clinical units of the Hospital;
- 4) New Pediatric X-ray Suite; and
- 5) Endowment to support patient-care and educational programs at the Hospital.

The need for three major clinical facilities at the Hospital was so great that their construction was started on borrowed funds as far back as 1969. Two of the facilities were completed and placed in service in 1973 and the third will be in service by the time this report is received. Although much of the financing for the projects must still be raised, approximately \$3,500,000 was saved in construction costs by starting with borrowed funds when construction costs

were well below today's level. The projects are as follows:

1) A modern Emergency Facility at Vanderbilt Clinic, equipped and staffed to deal with any type of medical, surgical or dental emergency within the Unit. The new facility was opened to patients on October 1, 1973, and is part of Phase I, in the overall plan to modernize and expand Vanderbilt Clinic. Included also in Phase I are a new Entrance Lobby to the Clinic, new Clinical Administration Offices, and a new Personnel Medical Service Facility, all of which are now in use.

2) New Diagnostic Laboratory Facilities, centrally located, equipped and staffed to serve all clinical units of the Hospital, were opened on September 28.

3) A new, greatly enlarged Neonatal Nursery and Intensive Care Unit is nearing completion on the 12th floor of Babies Hospital.

Other new clinical facilities, under construction or through the planning stage, are: Four new Inpatient-Care Floors in the wing of Babies Hospital; a new Clinical Research Center, Cancer Research Center, and Hemodialysis and Renal Unit on the fourth floor of The Presbyterian Hospital.

We are pleased to announce the election of Dr. John H. Laragh as Vice-Chairman of the Board of Trustees and a member of the Executive Committee of The Presbyterian Hospital. In this newly created position, Dr. Laragh will be responsible for all professional staffing and scientific and health programs at the Hospital. He will continue as Professor of Clinical Medicine and Chief of the Hypertension Center at Columbia-Presbyterian Medical Center.

We take this opportunity to welcome four new directors of service who assumed their responsibilities in 1973: Dr. Henrik H. Bendixen, Director of the Anesthesiology Service; Dr. Leonard C. Harber, Director of the Dermatology Service; Dr. Lewis P. Rowland, Director of the Neurology Service; and Dr. E. B. Schlesinger, Director of the Neurological Surgery Service. Each of these distinguished physicians brings to his new appointment an enviable record of achievement in his specialty and a dedication to the needs of patients that will assure the continuation and enhancement of the Hospital's century-old traditions of service.

We are pleased to welcome five new members of the Board of Trustees, whose skills and experience in their respective fields and deep interest in community service will strengthen the Board in many areas. The new trustees are: Mr. Edward H. Auchincloss, President, Auchincloss and Lawrence, Incorporated; Mr. Robert H. B. Baldwin, President, Mor-

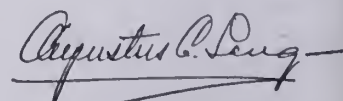
gan Stanley & Co., Inc.; Mr. Henry W. Gadsden, Chairman of the Board of Directors and President, Merck & Co., Inc.; Mr. Maurice F. Granville, Chairman of the Board of Directors and Chief Executive Officer, Texaco Inc.; and William B. Seaman, M.D., Director, Radiology Service, The Presbyterian Hospital in the City of New York. We are also pleased to welcome the Rev. Norman Vincent Peale, D.D., Senior Minister, Collegiate Church of New York, as honorary trustee. General Lucius D. Clay and Thomas C. Fogarty, also became honorary trustees last year.

We take this opportunity to express a special word of thanks to General Clay for his extraordinary devotion to the Hospital over almost two decades. His support and personal counsel, and his leadership of the first program of renewal and expansion of Columbia-Presbyterian Medical Center have been an inspiration to us all.

It is with sadness and a deep sense of personal loss that we report the death of Trustee H. I. Romnes, and former Trustee John A. Hill; and 13 physicians who served the Hospital and its patients so faithfully: Drs. E. Everett Bunzel, Angus Frantz, A. David Gurewitsch, John M. Hanford, Harold D. Harvey, Julia Jones, Alfred Langmann, Maurice Lenz, Robert F. Loeb, Aildred MacDonald, Arthur E. Neergaard, Fordyce B. St. John and Sigmund L. Wilens.

All members of the Board of Trustees join me in expressing admiration for and gratitude to the professional staff and personnel for their continued loyalty and dedication to the ideals and traditions of service of The Presbyterian Hospital. Our very special thanks must go to our loyal Auxiliaries and Volunteers, without whose help and inspiration the Hospital could not meet its obligation to the thousands who come here seeking medical assistance.

As the Hospital's financial needs continue to grow, we offer our thanks to the many friends and supporters of the Hospital, whose gifts and grants help make this great voluntary Hospital possible, and we beg their continued support of the present development program to provide facilities that are essential to the future of the Hospital and the 140,000 patients it serves.



AUGUSTUS C. LONG
Chairman of the Board

April 1, 1974

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York



Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital on November 1, 1973 saw one of the tangible results of its Development Fund efforts when the new Vanderbilt Clinic emergency facilities were opened. These were some years in the planning stage and now that they are in use, they are a source of satisfaction and pride to the professional staff. Changing patterns of medical care and of the area in which Presbyterian is located have, in turn, changed the number of patients and the type of care needed in the emergency area. The number of patients requiring emergency services has increased steadily since Vanderbilt Clinic opened its doors in 1929, dramatically in recent years, so need of the new enlarged facilities is obvious. We are grateful to all who helped make them possible, whether by contribution of funds or by participation in the physical planning. They help us serve our patients better.

Mr. Harold H. Helm has assumed the chairmanship of our current Development Fund campaign and to date has very definitely shown that his enthusiasm, dedication, and ability to get everyone to work together will be a strong force in our reaching our goal of \$134,000,000.

Projects in the Development Program will be undertaken as funds permit. Presbyterian Hospital's main building is over forty years old and while the quality of medical care has not suffered, there are many areas where changes in treatment and equipment require enlarged space to provide the care we want to give. Currently a committee of the Medical Board is studying a list of proposed projects, to develop priorities and help assure that the most urgent items from the standpoint of patient care receive highest priority.

As is true of most non-profit institutions, financial

problems continue to mount. On one hand, demands for quality care are increasing and the cost of delivering that care is rising; on the other hand, income is not rising at the same rate. The Medical Board is participating in studies of ways in which costs may be cut without loss of vital services.

Many members of the attending staff of the Hospital have joined together to form the Society of Practitioners of the Columbia-Presbyterian Medical Center. This is a dedicated group of doctors who are interested in our maintaining the high level of teaching, research and care of patients in an environment of private practice. In this present day of curtailed government support, it becomes ever more evident that private practice in some form or other must be maintained. State and Federal subsidies are dwindling rapidly as far as research and teaching funds are concerned and therefore a group such as the Practitioners is most important since they support themselves through private practice while doing a great share in teaching, patient care, and research.

While administrative problems of a financial nature continue, the professional staff faces increased demands for paper work. In an effort to raise standards of medical care nationally, the Congress of the United States has mandated the establishment of Professional Standards Review Organizations. Peer review of the quality of medical and surgical care will be carried out to see if the patient is receiving the best that can be given in that particular community. This will entail a tremendous amount of work from each and every physician and surgeon and without question everyone will be involved. There are many ramifications to this legislation which will have to be negotiated, adjudicated, and polished but it is the law of the land and must be carried out.

The past year has seen increasing participation by the professional staff in areas once considered outside the professional's interest. For example, the Staff Committee of the Medical Board, which is composed of younger members of the attending staff, recently completed an extensive and helpful study of security measures in the Hospital.

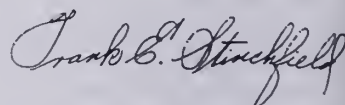
It is very gratifying to see the splendid relations that exist between the Hospital's Board of Trustees and the professional staff. Four members of the Medical Board, including myself as President, participate in meetings of the Board of Trustees and it is encouraging to see the deep concern with which the trustees approach the solving of the Hospital's problems and the continuing improvement in its service to patients.

Our channels of communication have been improved by the approval of an Office of the Medical Board and now each month the professional staff receives an informal resume of Medical Board discussions.

In the past year we lost the active participation of General Lucius D. Clay on the Board of Trustees and on the Development Program and we are grateful that, while not as active, his interest in the Hospital will continue.

In 1973 the Hospital welcomed three new Directors of Service: Dr. Henrik H. Bendixen, Director of Anesthesiology; Dr. Leonard C. Harber, Director of Dermatology; and Dr. Lewis P. Rowland, Director of Neurology. Dr. Edward B. Schlesinger, a longtime member of the professional staff, was appointed Director of Neurological Surgery. Dr. Robert C. Darling and Dr. Carl T. Nelson retired as Directors of Rehabilitation Medicine and Dermatology, respectively, and were appointed Consultants and Honorary Members of the Medical Board.

In conclusion: 1973 has been a busy year, one of changes and one of challenges. Given the excellent staff and the splendid support from the Hospital's Trustees, I know 1974 will show added growth in our care and service to patients. I speak for the entire staff when I say we are all anxious to be of assistance in any way we can.

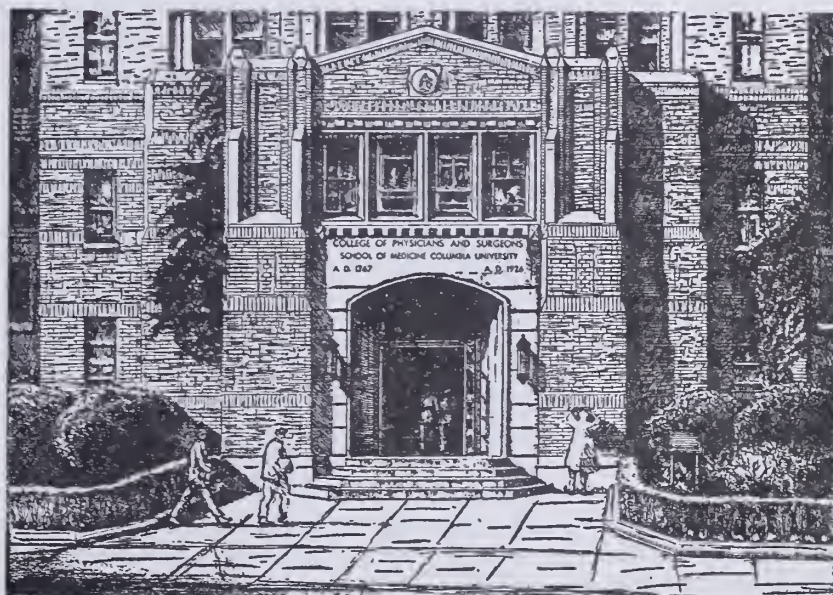


FRANK E. STINCHFIELD, M.D.
President, Medical Board

December 31, 1973

Annual Reports of the
Vice President for Health Sciences
and the
Dean of the Faculty of Medicine
for 1973

College of Physicians and Surgeons
Columbia University in the City of New York



Report of the Vice President for Health Sciences

I have the honor to submit the first Annual Report of the Vice President for Health Sciences for the year ending December 31, 1973. During the past year the Health Sciences Faculties realized a number of major goals. In the academic programs, these included: the combined M.D.-Ph.D. program involving the Faculties of the Health Sciences and the Graduate Faculties at the Washington Heights and Morningside Heights campuses; the initiation of a four-year baccalaureate program in nursing, a joint effort of the School of Nursing, School of General Studies, and Barnard College; and the combined M.P.H.-M.B.A. program offered by the School of Public Health and the Graduate School of Business. The successful recruitment of outstanding men and women to leadership roles in the Institution continued during 1973: Dr. Harold Ginsberg, recruited from the University of Pennsylvania, became Professor and Chairman of the Department of Microbiology; Dr. Leonard Harber, recruited from New York University, became Professor and Chairman of the Department of Dermatology; Dr. Henrik Bendixen, recruited from the University of California in San Diego, became Professor and Chairman of the Department of Anesthesiology; Dr. Lewis P. Rowland, recruited from the University of Pennsylvania, became Professor and Chairman of the Department of Neurology. During the past three years, in addition to new Directors for three of the Institutes and for the Medical Library and personnel for other important senior faculty and administrative posts, new chairmen have been recruited for 12 of the major departments of the Faculties of the Health Sciences.

The Faculties of the Health Sciences continued to generate the needed support for their training and research efforts. In 1973, as compared with 1972, the absolute dollar support from the federal government for research programs of our Faculties increased by

over \$1,000,000. Support from nonfederal sources including major public and private foundations, as well as individual friends of the University, has played a particularly important role during the past year in permitting ongoing and new programs to flourish. These included an important pilot program in multimedia production and development for teaching in the Health Sciences; the continuing and new programs of the Center for Community Health Systems—among these a program for comprehensive care for children—and broad targeted research programs in diseases ranging from hypertension and cardiovascular disorders to alcoholism and cancer.

Among the most important developments of 1973 was the commitment taken by the Trustees of Columbia University and of the Presbyterian Hospital to a \$133,750,000 capital campaign to provide for critically needed expansion and renewal of the facilities of the CPMC. The Health Sciences Faculties face many challenges and opportunities in health manpower education and medical research which could not be foreseen when the Center's facilities were planned in the middle 1920's. When they were completed in 1928, the College buildings accommodated approximately 400 medical students and a little over 100 dental students. In the past 40 years, the student body of the Health Sciences Faculties of Columbia University has increased to nearly 3,000 full-time equivalent students in some 15 different degree-granting programs; and our full-time and part-time faculty has grown from approximately 500 to almost 2,000 (Figure 1). The projects in the capital campaign were developed with great care and represent the highest priority needs of the Columbia-Presbyterian Medical Center to provide facilities adequate for the leadership role that it must continue to serve in patient care, health professional education, and medical research.

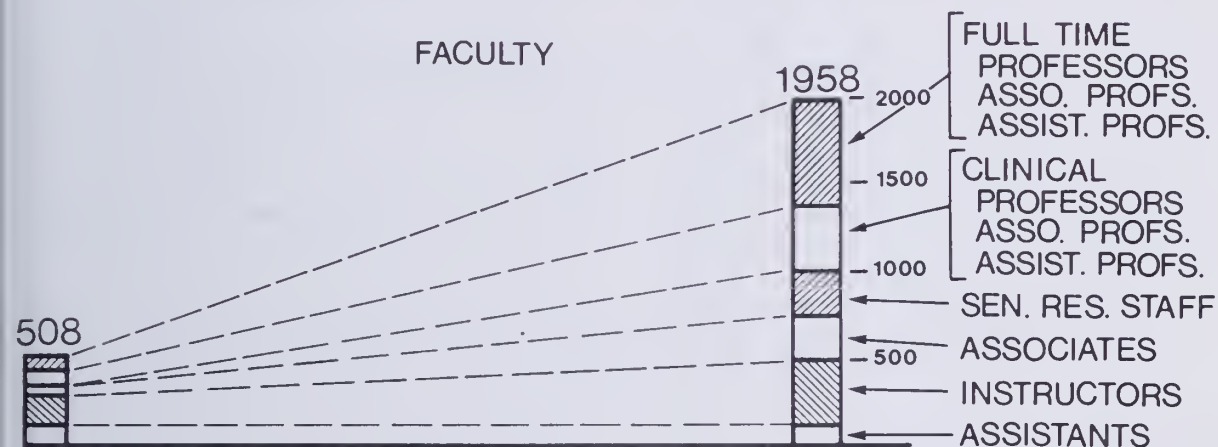
During the past year, in addition to the develop-

ments in academic programs and facilities planning, a new administrative organization for the Faculties of the Health Sciences was implemented to provide a more effective system for the unified direction and oversight of these Faculties. On the recommendation of President William J. McGill, the Trustees of Columbia University approved the establishment of a

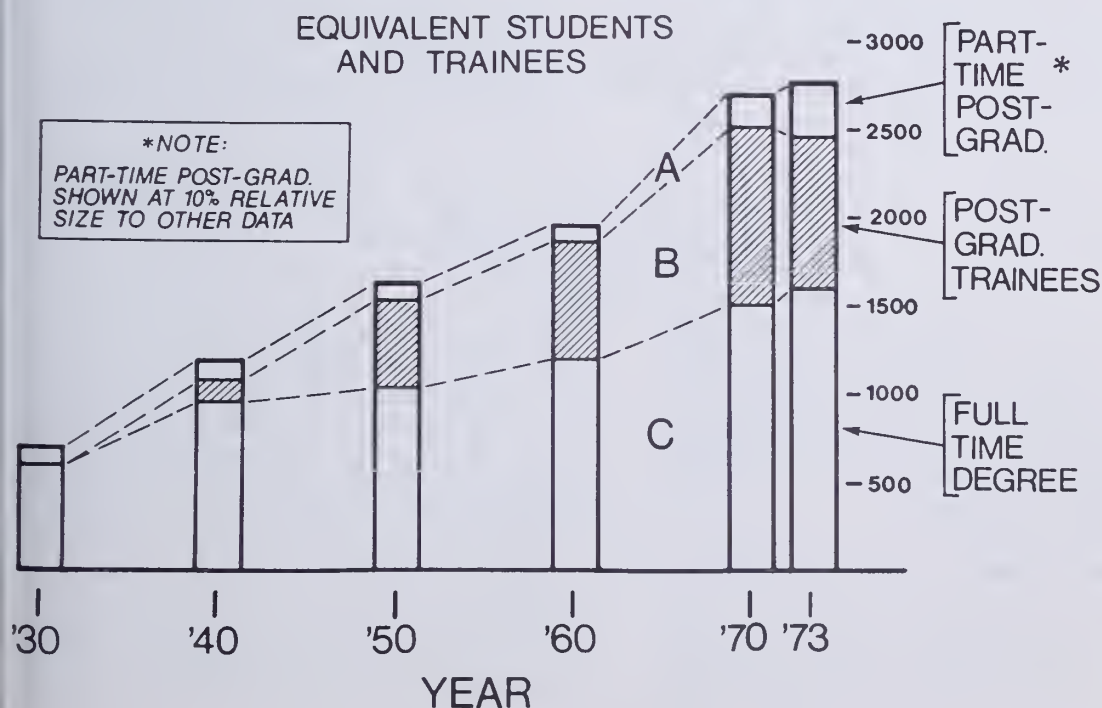
standing committee of the Trustees on Health Sciences and the separation of the Office of Vice President in Charge of Medical Affairs and Dean of the Faculty of Medicine, with a change in the Vice President's title to Vice President for Health Sciences. These administrative changes represent an evolution in the University's Health Sciences pro-

COLUMBIA UNIVERSITY – FACULTY, STUDENTS & TRAINEES

COLUMBIA PRESBYTERIAN MEDICAL CENTER



EQUIVALENT STUDENTS AND TRAINEES



grams, which have grown so markedly in the last three decades. Today the Health Sciences Faculties of Columbia University include: the College of Physicians and Surgeons, the School of Dental and Oral Surgery, the School of Nursing, the School of Public Health, the Allied Health Professions Program (Occupational Therapy, Physical Therapy, Dental Hygiene, and others), the Institute of Cancer Research and the Cancer Research Center, the Institute of Human Nutrition, the International Institute for the Study of Human Reproduction, and the Center for Community Health Systems. Within the College of Physicians and Surgeons there are 17 clinical departments and seven basic sciences departments. In implementing these administrative changes, a broad-ranging and in-depth review of all the academic programs of the Faculties of the Health Sciences was instituted during the past year. It is the object of this review to define priorities for the University's Health Sciences programs, to optimize the utilization of our resources, and to develop needed new programs. A major commitment under the new administrative organization is the development program for the Capital Campaign and the long-range development of policies and planning for the Faculties of the Health Sciences within the University.

Finances and Administration

In both these areas 1973 was a turbulent year at national, state, city, university, medical center, and school levels. In spite of the turbulence, the complicated financial web that supports the Health Sciences Faculties remained much the same as in recent years. At the start of 1974 the federally sponsored training programs were restored for another year. The effect, however, of the one-year stoppage was dramatic, even under the phase-out program adopted by the N.I.H. In dollars, the training level dropped from \$6,209,300 in December, 1972 to \$4,670,000 in December, 1973. Government-sponsored research programs, on the other hand, continued to diminish in number (from 247 to 229) while staying nearly constant in dollars (\$23,270,100 in 1972 as compared to \$23,494,100 in 1973). This reflects the growing trend toward targeted research, as in Cancer and the Heart-Lung areas, with growing numbers of federally sponsored Centers.

Institutional support for education from state and federal sources attracted a great deal of public attention this year. Of particular note is the high cost of medical and dental education. The American Association of Medical Colleges recently published a study of the costs of medical education indicating

that the annual cost to the institution ranged from \$16,000 to \$26,000 per year. Also, the Institute of Medicine of the National Academy of Sciences, just prior to the report being printed, announced the results of its two-year study mandated by Congress. This report indicated costs of \$12,650 per year for medical students and \$9,050 for dental students. Whichever study is most appropriate will be widely debated in the year to come. However, it is evident that the problem is grave and complex and that medical education is terribly expensive, the costs far exceeding the tuition and endowment resources of private universities like Columbia.

The plight of private medical education and private universities is being aired more and more. Columbia went through a very difficult period from 1966 to 1974, with annual deficits as high as \$15 million. With stringent financial controls and a devoted faculty which was highly successful in competition for sponsored project funding, both the Medical School and the University were able to reverse the deficit trends. Break-even budgets are projected for the academic year 1974-75, assuming that federal and state institutional support continues at existing levels. However, no sooner did these plans become reality than we were all beset by the so-called "energy crisis." The net effect of these new socioeconomic phenomena is only now being appraised as fuel costs have increased by a factor of 3 and electricity costs by nearly 50 per cent. The effect on the medical and dental schools may be to increase heating and electrical costs by nearly a million dollars per year and by nearly \$3 million for the University as a whole.

All these events are whirling about us while Columbia University embarks on a major construction program at the Medical Center jointly with Presbyterian Hospital. On April 11, 1973 ground was broken to start construction of the Augustus Long Library-Health Sciences Center. This twenty-story facility is due to be completed, using the "fast-track" method of construction, in the Fall of 1975. The completed building is projected to cost \$30,625,000 and will house the expanded Health Sciences Library, the Health Sciences Teaching Center, and an Audio-visual Center in the lower half of the building. The upper section of the building will provide much-needed academic space. Additional plans are being developed for major rehabilitation of the P&S Building as a part of the joint capital campaign.

The growing demands caused by the financial problems, increased requirements for accountability, and the physical planning and construction activity led to major changes in the organizational structure of the health sciences. In addition to the formation

of a Vice Presidency for Health Sciences, the recruitment of a Director for Health Sciences Personnel, and a Director of Buildings and Grounds, a new office has been formed for Facilities Planning and Construction. This office, which has responsibility for all Health Sciences construction, is headed by Mr. Henry J. Wald, P.E., who joined us after a distinguished career as a consulting engineer. With the current construction project work load in excess of \$33,000,000 and planning activities on an additional \$20,000,000 this office has become a center of activity.

The financial review is summarized in the accompanying tables. The trends are obvious but the solutions elusive.

Paul A. Marks

PAUL A. MARKS, M.D.
Vice President for
Health Sciences

December 31, 1973

TABLE I
GOVERNMENT-SPONSORED GRANTS AND CONTRACTS

	<i>As of June 30</i>				
	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Number	430	404	401	386	356
Amount	39,556,000	42,081,000	46,912,200	48,964,500	48,250,900*

*Representing a \$1,190,000 increase in research funds and a \$1,900,000 decrease in training funds, as compared with 1972.

TABLE II
ANALYSIS OF HEALTH SCIENCES FACULTY SALARY SUPPORT AS OF DECEMBER 31
(000 omitted)

Sources of Support	<u>1970</u>		<u>1971</u>		<u>1972</u>		<u>1973</u>	
Outside Sources	13,860*	65.9%	15,833*	71.5%	18,030	75.0%	19,514*	70.7%
Gifts & Receipts	3,483	16.6%	2,601	11.8%	2,465	10.0%	3,288	11.9%
University Endowment Income	2,581	12.3%	1,741	8.1%	1,706	7.1%	2,328	8.4%
University General Income ...	<u>1,099</u>	<u>5.2%</u>	<u>1,922</u>	<u>8.6%</u>	<u>1,949</u>	<u>7.9%</u>	<u>2,467</u>	<u>9.0%</u>
	21,023	100.0%	22,097	100.0%	24,150	100.0%	27,597	100.0%

*Government research grants and contracts, Presbyterian Hospital, City Hospital affiliations, gifts for specific purposes, and other Government support.

TABLE III
GENERAL BUDGET SUMMARY
HEALTH SCIENCES FACULTIES
As of December 31, 1973
(000 omitted)

	<u>General Income</u>		<u>Endowment Income</u>		<u>Gifts & Receipts</u>		<u>Outside* Sources</u>		<u>Total</u>	
Officers	\$2,467	55.1%	\$2,328	78.9%	\$ 3,288	26.4%	\$19,514	41.9%	\$27,597	41.6%
Supporting Staff ...	1,687	37.6	623	21.1	3,146	25.3	6,831	14.7	12,287	18.5
Other Expenses	<u>327</u>	<u>7.3</u>	<u>—</u>	<u>—</u>	<u>5,998</u>	<u>48.3</u>	<u>20,207</u>	<u>43.4</u>	<u>26,532</u>	<u>39.9</u>
Total	\$4,481	100.0%	\$2,951	100.0%	\$12,432	100.0%	\$46,552	100.0%	\$66,416	100.0%
% of Total	6.7%		4.4%		18.7%		70.2%		100%	

*Estimated expenditures for grants and contracts based on budgets of grants in force as of December 31, 1973.

Report of the Dean of the Faculty of Medicine

It is a great pleasure to submit the Annual Report of the Faculty of Medicine midway through its 207th year. All institutions of such age pass through times of consolidation and times of growth. This faculty is, I believe, in a period of vigorous resurgence as we learn to cope with significant changes in the patterns of funding for medical education, medical research, and patient care.

During the past few years we have increased our responsiveness to the health problems of the vast population around us. While maintaining our intimate ties with The Presbyterian Hospital and other hospitals in the Medical Center complex, we have forged stronger ties with the Harlem Hospital Center, the Roosevelt Hospital, and the St. Luke's Hospital Center. These three hospitals are already functioning as primary teaching hospitals of P&S and plans have been completed for the development of Roosevelt and St. Luke's Hospitals as primary teaching hospitals for the School of Nursing. We are, thus, closely tied to a consortium of hospitals which serve Upper Manhattan and, of necessity, must be concerned with the health problems of a large portion of New York City. As health professionals, members of the Faculty of Medicine continue to be sensitive to the inadequacies of our health services, both on a national and on a local level. As a University, we cannot take on the direct responsibility for patient care but we can assume the responsibility of providing the creative leadership necessary to meet these challenges, as well as to educate the health professionals to provide this leadership. We are actively involved in these plans for change throughout the faculty: in the Medical School, in the School of Public Health, and in the School of Nursing. In addition, we are strengthening our current programs in Allied Health, while planning for the development of new ones. This faculty is clearly committed to the highest standards in its academic

programs and to innovations in education. In the years ahead it will be reaching out beyond traditional biomedical sciences in seeking ways to meet the urgent health needs both of this community and of the nation.

During the past year the School was faced with the retirement of Dr. Carl T. Nelson, as Chairman of the Department of Dermatology, Dr. Harry M. Rose, as Chairman of the Department of Microbiology, Dr. J. Lawrence Pool, as Chairman of the Department of Neurological Surgery, Dr. Robert C. Darling, as Chairman of the Department of Rehabilitation Medicine, and of Mr. Thomas P. Fleming, as Medical Librarian. In addition, Dr. Shih-hsun Ngai, Chairman of the Department of Anesthesiology and Dr. Richard L. Masland, Chairman of the Department of Neurology, indicated their wish to be relieved of their departmental administrative duties; fortunately, they both will remain in their professional positions. We have been successful in recruiting Dr. Henrik H. Bendixen as Chairman of the Department of Anesthesiology from the University of California at San Diego, Dr. Leonard C. Harber as Chairman of the Department of Dermatology from New York University School of Medicine, Dr. Harold S. Ginsberg as Chairman of the Department of Microbiology from the University of Pennsylvania, and Dr. Lewis P. Rowland as Chairman of the Department of Neurology from the University of Pennsylvania. In addition, we were fortunate in being able to appoint Dr. Edward B. Schlesinger as Chairman of the Department of Neurological Surgery and the first Byron Stookey Professor of Neurological Surgery. Mr. C. Lee Jones was recruited from the University of Texas as the new Medical Librarian. At this writing, committees are currently seeking new chairmen for the Departments of Anatomy, Biochemistry, Ophthalmology, and Otolaryngology, as well as a new Director for

the International Institute for the Study of Human Reproduction.

During the course of the year, Dr. Lawrence E. Stevens was appointed the first Ailsa Mellon Bruce Professor of Surgery at St. Luke's Hospital; Dr. Robert S. Neuwirth was nominated for the position of Director of the Obstetrical and Gynecological Service at St. Luke's Hospital; Dr. John C. Newton was nominated as a Director of the Ophthalmology Service at St. Luke's Hospital; Dr. Joseph W. Fielding was nominated as a Director of the Orthopedic Service at St. Luke's Hospital, and Dr. Lewis Z. Cooper was recruited from New York University School of Medicine as the new Director of the Pediatric Service at the Roosevelt Hospital. The function of Search Committees in all of our hospitals is clearly a crucial mechanism in recruiting to these important posts individuals of the caliber essential to the success of our programs.

During the year, two new endowed lectureships were created. First is the Alexander Ming Fisher Lectureship; on the advice of a Faculty Committee, the first lecture will be given by Dr. Cecily Saunders, who is the Medical Director of St. Christopher's Hospice in London. The Cartwright Lectureships, which were started by the Alumni Association in 1886 but allowed to lapse in 1911, have been reinstituted and a Faculty Committee is currently choosing the first lecturer of the new series. Through the generosity of the National Alpha Omega Alpha, a David Seegal Visiting Professorship has been established. The first David Seegal Visiting Professor will be Dr. Donald W. Seldin of the University of Texas.

In memory of Dr. Robert F. Loeb, Bard Professor Emeritus, who died during the year, the Robert F. Loeb Award for Excellence in Clinical Medicine was set up through the generosity of friends and col-

leagues. The Award will be given annually to a member of the graduating class of the College of Physicians and Surgeons.

Student Registration

The registration of the School of Medicine in September 1973 was as follows:

First Year	153*
Second Year	143
Third Year	137
Fourth Year	147

*Includes 6 repeaters.

In the School of Public Health the registration at the same time was as follows:

D.P.H.	16
M.P.H.	103
M.S. (Administrative Medicine)	19
M.S. (Biostatistics)	3
M.S. (Community and Soc. Psychiat)...	9
M.S. (Epidemiology)	2
M.S. (Hospital Administration)	10
M.S. (Parasitology)	1
Special Students	42

In the Department of Nursing, enrollment was as follows:

B.S. (five terms)	88
B.S. (six terms)	204
B.S. (four-year program)	34
M.S. (Maternity Nursing)	16
M.S. (Psychiatry and Community Mental Health)	14
Special Students	2

In all, 55 students were registered in the Course for Occupational Therapists in September 1973, and 50, in the Course for Physical Therapists.

The following degrees were awarded:

M.D.	127
M.P.H.	28
D.P.H.	3
M.S. (Nursing, Occupational Therapy, Public Health)	66
B.S. (Nursing, Occupational Therapy, Physical Therapy	141

SCHOLARSHIPS

Year	University	Health Professions Scholarship Program	Other Scholarships	Number of Awards
1969-70	\$185,400	\$100,000		141
1970-71	288,300	90,700		166
1971-72	287,678	88,889		190
1972-73	576,574	77,520	\$259,144	220

(Total scholarships, 1972-1973: \$913,238)

LOANS

Year	University	Health Professions Student Loan Program	Other	Number of Awards
1969-70	\$ 1,000	\$101,185	\$ 65,600	134
1970-71	13,750	104,587	29,533	158
1971-72	7,450	210,669	33,990	124
1972-73	28,662	249,588	317,890	332

(Total loans, 1972-73: \$596,140)

(Total financial aid, 1972-73: \$1,509,378)

Medical School Admissions

Dr. Frederick G. Hofmann, Associate Dean for Admissions for the Medical School, has continued to cope with the challenge presented by the upward spiral in medical applications, which continued essentially unabated last year. The following table indicates how markedly the work of the Admissions Office and the Committee on Admissions has increased in the past four years:

	1969-70	1970-71	1971-72	1972-73
No. of applicants* ..	1,809	1,962	3,060	3,789
Entering class size ..	137	137	147	147
No. of applicants per place in the class†.	13	14	21	27
No. of applicants interviewed	513	765	1,265	1,403
No. of women applying	206	276	557	831

*Completed applications; each year, hundreds of applicants fail to complete their applications.

†Rounded to the nearest whole number.

The growing prominence of women among the applicants to P&S is also indicated in the table. While the total numbers of applicants doubled in the four-year period depicted in the table, the number of women applying quadrupled; the number of women enrolled annually has tripled over this span of time.

The admissions situation today at P&S and most of the nation's medical schools is highly inappropriate in that the schools are deluged by applications in numbers greatly in excess of any school's ability for assimilation and thorough evaluation and certainly in excess of the size of group needed for selection of a satisfactory entering class. The number of applicants interviewed at P&S last year who ultimately received the highest rank assigned by the Committee exceeded our requirements by two to three hundred.

The possibilities for unproductive activity are clearly very great in the sphere of medical admissions today; the Committee on Admissions has accordingly shortened the period of time during which applications for admission may be submitted and has set a limit on the number of applicants to be interviewed. These limits may be safely set because of the relatively large number of highly qualified applicants who promptly apply to P&S for admission each year.

Pressure often deforms or distorts, and several of the most undesirable aspects of the current scene in medical admissions reflect just such pressure. The price of obtaining nearly perfect academic records is, in some cases, such devotion to studies that the continuing processes of emotional and social maturation may be essentially arrested. Premedical students commonly refuse to talk to one another

about course work for fear of enhancing the competitive position of a classmate in the race for top grades. Instances of notebooks and the results of laboratory work being stolen and of locks being forced to gain previews of examinations and letters of recommendation to medical schools have been reported in growing numbers from universities across the country, including the most illustrious ones. Medical schools, for their part, have in some cases adopted admissions criteria of questionable validity in desperate attempts to reduce the large groups of applicants to manageably small numbers. One of the commonest of these devices is the setting of a minimally acceptable overall grade point average; while a criterion of this sort has been in effect, explicitly or tacitly, for decades at many schools, never has the minimum been so high or enforced so inflexibly. For many premedical students, scholarship has consequently come to have no meaning other than the getting of high grades; there is little joy in learning or in knowledge for its own sake. The Committee on Admissions has diligently attempted to identify and to deflect such applicants.

Urban and Community Health Affairs

The Office of Urban and Community Health Affairs, under the directorship of Dr. George I. Lythcott, Associate Dean, and Dr. Bernard Challenor, Assistant Dean, has continued to serve as an interface between the College of Physicians and Surgeons and its immediate and extended communities in a broad spectrum of activities related to health. These communities include several of those served by hospitals affiliated with the University, i.e., Presbyterian, St. Luke's, Delafield, Harlem, and Roosevelt. Including Washington Heights—Inwood, West and Central Harlem, Morningside Heights, and Manhattan Valley, these communities represent a population of approximately two million people. The Office is also responsible for the administration of the affiliation contracts between Harlem and Delafield Hospitals and the University. By the terms of the affiliation agreements with the New York City Health and Hospitals Corporation, the University is responsible for the organization, administration, and provision of professional services at Harlem Hospital Center, an 1100-bed municipal hospital, and at Delafield Hospital, a municipal hospital with 250 beds.

The Office has additionally been centrally involved in the development and ongoing operation of the Center for Community Health Systems. The Center now serves as a resource to the University and to agencies and institutions which provide health care, with a major emphasis on improving traditional sys-

tems of care and developing new models for health care delivery, in addition to providing a new framework for the training of health professionals and allied health professionals.

With the collaboration of Harlem Hospital Center and Antioch College, the Office has commenced the second year of a three-year contract with the National Institutes of Health for expanding and further developing a program for training physician associates at Harlem Hospital Center. Accredited during 1973 by the American Medical Association and the New York State Department of Education, the program is one of the first nation-wide to offer a Baccalaureate degree in conjunction with two years of intensive clinical and academic education to outstanding former U.S. Armed Forces medical corpsmen, nurses aides, medical technicians, and other allied health personnel with longstanding practical experience and achievement in a variety of health fields. The first class of students graduated in December, 1973 and will be employed at Harlem Hospital Center beginning in 1974. The program was previously supported by funds from the Manpower and Career Development Administration of the New York City Human Resources Administration, and Metropolitan Life Insurance Company.

A Faculty Committee on International Medical Education, created by the Dean of the Faculty of Medicine and developed by this Office, has continued to provide guidance to students on matters relating to international education and health care, involving overseas electives for P&S students as well as programs for foreign students, both graduate and undergraduate, at P&S. Currently, this Committee is discussing a more broad involvement in international medical programs, especially with regard to delivery of health care in developing countries.

The Minority Student Recruitment Program, administered jointly by this Office and the Alumni Association of P&S, continued operations during 1973, initiating visits by P&S medical students to more than 80 undergraduate colleges in 13 states for the purpose of recruiting minority students to the College.

Curriculum

The Curriculum Committee, under the direction of Dr. Councilman Morgan, Associate Dean, continued intensive evaluation of courses, an undertaking greatly assisted by the helpful and constructive manner in which students of all four years responded to questionnaires. It has been five years since the curriculum was revised, and both faculty and students feel that the time has arrived for thorough

evaluation of the entire teaching program. Toward this end, the Curriculum Committee established faculty-student committees to consider specific segments of the curriculum. At a retreat on November 2-3, 1973, attended by 52 faculty and students, each committee formally reported its findings and recommendations, following which there was open discussion. In this format the entire curriculum was examined in detail. It was generally agreed that the first year was too compressed, containing as it does virtually all the basic science courses, and that careful attention must be paid to the elective program, particularly for those students entering specialties which no longer require internship. The Curriculum Committee in consultation with faculty is working actively on these and related aspects of the teaching program with the aim of submitting revisions for discussion by the Faculty Council.

The courses in small-group format on Psychosocial Aspects of Patient Care and on Ethics and Values in Health Care were continued under the direction of Dr. Bernard Schoenberg. Both are proving to be popular. In the first semester a multidisciplinary new elective course entitled Health and Society, under the direction of Dr. John Colombotos of the School of Public Health, has been developed in which medical, nursing, and public health students meet in small, mixed groups to examine their respective roles, their interaction with patients, and their relationship to the health care system. Three preceptors (physician, nurse, and social scientist) are assigned to each group. It is thus hoped to develop among students at the outset of their training a clearer understanding of the complex factors and interrelationships attendant upon health care.

Graduate and Postgraduate Programs

On the national scene of medical education, there is rapidly expanding interest in, and concern with, graduate and postgraduate education. At the College of Physicians and Surgeons, there is corresponding interest and concern. The position of Associate Dean for Postgraduate Education has been filled by Dr. Jose Ferrer. We are fortunate in having a strong base on which to build. This base consists of a major program of continuing education which serves a large number of practicing physicians. Two thousand five hundred physicians, both generalists and specialists, attended the 40 courses in postgraduate medicine offered by 12 departments of the College this year. These courses are mostly clinical in content and are designed to renew and update the knowledge of general practitioners as well as of physicians desiring training in various specialties.

The clinically related basic sciences are also amply represented among the available courses, and the basic scientific aspects of the specialized disciplines are invariably included in the clinical courses. Physicians attending these courses came from almost every state in the union, including those as far away as Alaska, Hawaii, and Washington. Other countries represented were Puerto Rico, Canada, Venezuela, and Italy. Five hundred and fifty audit students from both the attending and house staffs of the affiliated hospitals—Presbyterian, Harlem, Roosevelt, St. Luke's, Delafield, and Mary Imogene Bassett—also attended these courses. All of these courses are approved by the American Medical Association for credit toward its Physician's Recognition Award for Continuing Medical Education—an important fact in these days of peer review, P.S.R.O., relicensure, and specialist recertification.

It is the intention of the Office of Postgraduate Medicine to expand both the variety and number of these courses. Furthermore, the content of some courses will be reorganized and reprogrammed to make the material suitable for the production and distribution of audiovisual modules by which the physician can educate himself at home or in his office. Attempts will be made to determine the specific needs of the practicing physician in continuing his education and also to assess and evaluate the impact on the care of patients by the physicians participating in our programs. A specific program for the alumni of P&S is in the early planning stage.

The Institute of Human Nutrition had 188 students this academic year, offering twelve courses, while the School of Public Health offered thirty courses with an attendance of 1,250 students.

The challenge is great in graduate medical education. During this year, 169 interns and 758 residents were trained under faculty members at all of the affiliated hospitals. There were also 138 fellows, 236 American Trainees, and 127 visiting fellows from various foreign countries who participated in our training programs. The changing curricula at medical schools, including the shortening of the curriculum at some schools from four to three years, will place an increasing responsibility on the graduate education of house staff. The abolition of the free-standing internship and the elimination of the internship requirement by some specialty certifying boards will require the reorganization of residency training in some disciplines.

Economic pressures affecting training include the high cost of present house staff salaries; the sharply decreasing Federal governmental support for graduate medical education, particularly the recent can-

cellation of the N.I.H. clinical traineeships; and the increasing reluctance of third-party payers to finance the educational segment of residency training. Sociological pressures are also having an effect on graduate medical education. These include the maldistribution of physicians, both geographically and by specialty, and the need for the delivery of high-quality primary care to the inner city urban dwellers and the rural population of the country. The latter requirement will necessitate the training of more generalists and fewer specialists. It is clearly desirable that academic institutions participate more fully and more effectively in planning and implementing the necessary changes in graduate medical education. P&S intends to assume this academic responsibility in cooperation with all of its affiliated hospitals.

Several degree programs are also offered, including the Doctor of Medical Science degree, Master of Science in Human Nutrition, and special certificate programs in Community and Social Psychiatry. During the year, the Institute of Human Nutrition awarded nine degrees in Master of Science in Human Nutrition. One candidate received the Degree of Doctor of Medical Science on behalf of the Departments of Anatomy and Neurology, and three new candidates were enrolled for this degree. These degree programs are undergoing scrutiny with regard to their value and suitability in view of present priorities.

Allied Health Affairs

Dr. Bernard Schoenberg has continued his duties as Associate Dean for Allied Health Affairs, and, in addition, has assumed the duties of Acting Chairman of the Department of Rehabilitation Medicine.

During the past year, six faculty committees have planned curricula for the development of new baccalaureate programs in the allied health sciences. These programs comprise Community Nutrition, Community Mental Health, Health Administration, Health Information Systems, Family Life Sciences, and Health Education. On the basis of these committees' recommendations, directors of the allied health and nursing programs are attempting to structure a basic baccalaureate curriculum to fulfill the educational needs of the individual programs. The programs are to be developed in collaboration with the School of General Studies, and will attempt to effectively integrate general and professional education on the undergraduate level.

In planning for the development of new educational tracks, particular emphasis was placed on programs that will assist in alleviating anticipated

manpower shortages, are scarce in the New York region, and are oriented toward increased involvement in the prevention and treatment of community health problems.

Faculty from the Departments of Nursing, Public Health, Psychiatry, Physiology, and Anatomy and the programs in Occupational Therapy, Physical Therapy, and Dental Hygiene are collaborating with members of the undergraduate schools in the development of new modular instructional courses in Human Growth and Development, Anatomy—Physiology, and Epidemiology—Biostatistics. The modular instructional format will, to a large extent, utilize modern educational technology and will emphasize self-pacing and mastery before proceeding to the next learning level.

An advisory committee has been established to evaluate the need for nurse practitioners and physicians' assistants, and the educational requirements to develop new types of health personnel.

The Joint Allied Health Council has continued as a forum for the exchange of information on allied health activities at the Columbia-Presbyterian Medical Center.

The newly formed committee on the Health Careers Project is reviewing current activities of the Presbyterian Hospital and the University in providing programs for high school students and other members of the community to become familiar with the multiple opportunities for careers in the health care field. The committee will plan for the coordination of individual activities of the various programs and allow for more effective planning.

A committee on the formation of a student union has been established to assist students of the various health science programs of the University to coordinate their efforts in organizing various extracurricular activities of student life.

Alumni—Medical School Activities

During the year the P&S Alumni Association, under the leadership of President Anthony M. DeAngelis and the members of the P&S Alumni Council, continued to work closely with the Dean's Office to promote the interests of the College of Physicians and Surgeons and to organize its graduates towards that end.

The Alumni Association, through its annual Fund Drive and bequests from alumni during this calendar year, raised \$301,925.61 for P&S. Of this, \$180,042.67 was restricted to scholarship aid for P&S students, and \$27,329.09, to research, library, endowment and development; \$94,553.85 was unrestricted.

The Alumni Association again raised funds to continue the Minority Student Recruitment Program, which this year enabled 10 P&S students to visit 40 undergraduate schools, primarily in the South. As a result of these recruiting efforts, there has been a continued increase in the number of applications for admission to P&S and in acceptances of minority students with high academic potential.

Under the Association's expanded Student Alumni Relations Committee, several programs have been continued, for example: a program in which students spend a day with an alumnus in one of various specialties; an expanded alumni effort to secure summer employment for first-year medical students; hosting a wine and cheese party for first-year medical students; and sponsorship of the graduating class and their guests at the annual Alumni Day Banquet, which has become the main school social event of their four years at P&S. On this occasion, the Association also honors some of its outstanding graduates and members of the 50th, 25th, and other major reunion classes. The Association has continued the sponsorship and publication of the *P&S Quarterly*, a highly regarded medical alumni publication which is sent gratis to all alumni, faculty, and students.

In its efforts to involve and organize all of its alumni, the Association has hosted alumni receptions at scientific meetings in various parts of the country, and is intensifying its efforts to increase the participation of regional, area and state alumni representatives in all phases of its activities. This is in addition to the assistance these alumni have been giving for several years to the Admissions Committee in interviewing applicants for admission to P&S who were unable to come to New York for personal interviews. It has also set up a new committee to look into the need for, and the feasibility of, continuing education programs for alumni.

It is with the greatest sorrow that we report the following deaths during the year:

- Herbert J. Bartelstone, Professor of Pharmacology, on May 11, 1973
- Ernest Everett Bunzel, Consultant in Obstetrics and Gynecology, on September 17, 1973
- Angus MacDonald Frantz, Assistant Clinical Professor of Neurology (Retired) and Consultant, on July 16, 1973
- Samuel Graff, Professor Emeritus of Biochemistry, on September 25, 1973
- William Gross, Associate Professor of Radiology (Physics) on October 25, 1973
- John M. Hanford, Associate Professor of Clinical Surgery (Retired) and Consultant in Surgery, Presbyterian Hospital, on June 2, 1973
- Harold D. Harvey, Professor Emeritus of Clinical Surgery and Consultant in Surgery, on June 2, 1973

Julia-Mary Jones, Professor of Clinical Medicine, Associate Attending Physician, Presbyterian Hospital, and Visiting Physician, Harlem Hospital, on April 23, 1973

Alfred G. Langmann, Associate Clinical Professor of Pediatrics (Retired) and Consultant, Presbyterian Hospital, on May 24, 1973

Theodosia H. Mack, Instructor in Clinical Anesthesiology, on December 16, 1973

William Barclay Parsons, Jr., Professor Emeritus of Clinical Surgery and Consultant in Surgery, Presbyterian Hospital, on January 2, 1973

Dickinson W. Richards, Jr., Lambert Professor Emeritus of Medicine and Consultant, Presbyterian Hospital, on February 23, 1973

Anthony J. Rourke, Lecturer in Public Health, on August 23, 1973

Fordyce B. St. John, Professor Emeritus of Clinical Surgery and Consultant in Surgery, Presbyterian Hospital, on September 21, 1973

George K. Smelser, Aldrich Professor of Anatomy (assigned to Ophthalmology), on December 22, 1973

Leon Jair Taubenhaus, Lecturer in Public Health, on November 4, 1973

Vincent Valensi, Assistant Professor of Clinical Radiology, St. Luke's Hospital, on August 29, 1972

Sigmund L. Wilens, Professor of Pathology, on December 20, 1973

The following retirements, as of June 30, 1973, are reported:

Emil G. Bethke, Special Lecturer in Ophthalmology

Robert C. Darling, Simon Baruch Professor of Rehabilitation Medicine and Chairman of the Department

Shirley C. Fisk, Associate Professor of Clinical Medicine

Claudio Gerbi, Instructor in Medicine

Sara Ginsburg, Assistant Professor of Neurology

Ada Graff, Associate in Biochemistry

Samuel Graff, Professor in Biochemistry

Kathlene L. Hussey, Professor of Parasitology

Alva Jenkins, Associate in Public Health (Administrative Medicine)

Julia-Mary Jones, Professor of Clinical Medicine

James L. Leland, Clinical Professor of Medicine

Herbert C. Maier, Associate Clinical Professor of Surgery

Beatrice Mintz, Assistant Professor of Administrative Medicine

Carl T. Nelson, Professor of Dermatology and Chairman of the Department

Joseph Reibeison, Research Associate in Anatomy

William Hunter Stearns, Associate Clinical Professor of Medicine

Philip R. Steward, Instructor in Medicine

Herbert C. Stoerk, Professor of Pathology

Herbert B. Wilcox, Associate Clinical Professor of Medicine

The following emeritus designations, effective July 1, 1973, were made by the Trustees:

Robert C. Darling, Baruch Professor Emeritus of Rehabilitation Medicine

Samuel Graff, Professor Emeritus of Biochemistry
Carl T. Nelson, Professor Emeritus of Dermatology

The following designations were made during the year:

Jose M. Ferrer, Jr., Associate Dean for Postgraduate Education

Paul A. Marks, Frode Jensen Professor of Medicine

Richard L. Masland, H. Houston Merritt Professor of Neurology

Helen F. Pettit, Assistant Dean of Nursing

Saul L. Sanders, Acting Chairman of the Department of Dermatology

Edward B. Schlesinger, Byron Stookey Professor of Neurological Surgery and Chairman of the Department

Bernard Schoenberg, Acting Chairman of the Department of Rehabilitation Medicine

The following promotions were made during the year:

Howard J. Barnum, Jr., Instructor in Medicine

Mihaly Bartalos, Adjunct Assistant Professor of Human Genetics and Development

Ernst Georg Bartsich, Assistant Professor of Clinical Obstetrics and Gynecology

Mary E. Callahan, Professor of Physical Therapy

Noreen M. Clark, Assistant Professor of Public Health (Health Administration)

Lucien J. Cote, Associate Professor of Neurology

Catherine DeAngelis, Assistant Professor of Pediatrics and Public Health

Vaithilingham Dev, Assistant Professor of Human Genetics and Development

Ruth Dickinson, Associate Professor of Physical Therapy

Bruce P. Dohrenwend, Professor of Social Science (in Psychiatry) and Public Health (Epidemiology)

James Ducey, Associate in Medicine

Kenneth E. Eakins, Associate Professor of Pharmacology (in Ophthalmology)

Ann M. Earle, Associate Professor of Nursing

Marie Louise Franciscus, Professor of Occupational Therapy

Andrew G. Frantz, Professor of Medicine

Pureza Gaerlan, Assistant Professor of Clinical Pediatrics

Elsa G. V. Giardina, Associate in Medicine

Donald H. Harter, Professor of Neurology and Microbiology

Robert H. Heissenbuttal, Assistant Professor of Clinical Medicine

Georgiana Jagiello, Professor of Human Genetics and Development (in Obstetrics and Gynecology)

Althea M. Jones, Associate Professor of Physical Therapy

Thomas C. King, Professor of Surgery

Donald W. Kufe, Assistant Professor of Human Genetic and Development

Tamar Landau, Research Associate in Institute of Cancer Research

Ines Mandl, Associate Professor of Reproductive Biochemistry (in Obstetrics and Gynecology)

Henry Davis Messer, Associate in Neurological Surgery
Celia Ores, Assistant Professor of Clinical Pediatrics
Conrad L. Pirani, Professor of Pathology
Irwin J. Polk, Assistant Clinical Professor of Pediatrics,
St. Luke's
John D. Rainer, Professor of Clinical Psychiatry (in
Human Genetics and Development)
Rodolfo L. Reyes, Assistant Clinical Professor of Re-
habilitation Medicine
Abraham Spector, Professor of Ophthalmic Biochem-
istry (in Ophthalmology)
I. Bernard Weinstein, Professor of Medicine

The following new appointments were made dur-
ing the year:

John Desmond Allen, Research Associate in Pharma-
cology
Araceli R. Ancajas, Assistant in Pediatrics
Madeline W. Appell, Assistant Professor of Clinical
Pediatrics, Roosevelt Hospital
Stamatis E. Arkoulakis, Instructor in Plastic Surgery
Rosemary Lynn Ash, Director of Residence in Nursing
Rachel Rustow Aubrey, Research Associate in Inter-
national Institute for the Study of Human Repro-
duction
Phyllis A. Autotte, Lecturer in Nursing
Yaniv Avraham, Research Associate in Cancer Research
Judith Axelrod, Assistant Professor of Clinical Medi-
cine, St. Luke's Hospital
Charles J. Barbanel, Assistant in Psychiatry
Ellen R. Batt, Assistant Professor of Nursing
William G. Baxt, Research Associate in Institute of
Cancer Research
Patricia A. Beaulieu, Instructor in Nursing
Natalie Becker, Instructor in Public Health (Health
Administration)
Henrik H. Bendixen, Professor of Anesthesiology and
Chairman of the Department
Kenneth Myles Berc, Assistant in Psychiatry
John F. Bertles, Associate Professor of Medicine, St.
Luke's Hospital
Timo Besikari, Assistant Clinical Professor of Pedia-
trics, Roosevelt Hospital
Madhu M. Bhargava, Research Associate in Obstetrics
and Gynecology, Roosevelt Hospital
Sophie Ballard Bilezikian, Research Associate in Med-
icine
Patricia Blagman, Associate in Nursing
V. John Blazina, Instructor in Clinical Neurology
Robert S. Bloom, Instructor in Public Health (Health
Administration)
Carol A. Bodian, Assistant in Public Health (Biosta-
tistics)
Joseph M. Bordiuk, Assistant Clinical Professor of Pedia-
trics
Ernesto Bosch, Research Associate in International In-
stitute for the Study of Human Reproduction
Ronald Brisman, Instructor in Clinical Neurological
Surgery
Julian L. Brower, Assistant Professor of Pediatrics,
Roosevelt Hospital
Jay Brown, Instructor in Clinical Medicine
Margaret Fogel Brown, Instructor in Occupational Ther-
apy (Rehabilitation Medicine)

Elinor Buchbinder, Instructor in Clinical Nursing
Elena Buimovici-Klein, Assistant Clinical Professor of
Pediatrics, Roosevelt Hospital
Sunthorn Bunyaviroch, Associate in Obstetrics and Gyn-
ecology, Harlem Hospital
Bernard C. Burnett, Assistant in Clinical Medicine
Freda Claretta Bush, Instructor in Nursing
John C. Byrne, Assistant in Clinical Urology
Beverly A. Capaccio, Associate in Clinical Nursing
Roger S. Challop, Instructor in Pediatrics
Boris Carl Chandler, Instructor in Clinical Surgery
Nancy K. Charles, Assistant Director, Residence, Nursing
Harvey R. Chertoff, Instructor in Psychiatry
John Ormond Cisar, Research Associate in Microbiology
Patricia R. Cohen, Assistant Professor of Public Health
(Epidemiology)
Louis Z. Cooper, Professor of Pediatrics, Roosevelt
Hospital
Michael D. Cooper, Instructor in Clinical Radiology,
Diagnostic Radiology
John L. Costa, Instructor in Pediatrics
Kathryn Ann W. Cozine, Instructor in Anesthesiology
Mary C. McCrea Curnen, Research Associate in Public
Health (Epidemiology)
Earland Cyrus, Associate in Public Health (Health
Administration)
Gloria L. A. Dammann, Lecturer in Public Health
(Nursing)
Hasi Das, Instructor in Clinical Obstetrics and Gyn-
ecology
Susan M. Deakins, Instructor in Clinical Medicine,
Roosevelt Hospital
John vanB. Dean, Assistant Professor of Clinical Med-
icine
Catherine DeAngelis, Assistant Professor of Pediatrics
and Public Health
Roy Debutta, Research Associate in Ophthalmology
Victor Bernal y Del Rio, Lecturer in Psychiatry
Carmel N. Donovan, Instructor in Clinical Radiology,
Roosevelt Hospital
Elinor F. Downs, Associate Professor of Public Health
(Public Health Practice)
Duane W. Ebaugh, Research Associate in Pediatrics
Dorothy Ann Erickson, Assistant in Medicine
Peter D. Esser, Assistant in Radiology
Stanley Fahn, Professor of Neurology
Robert P. Feinstein, Assistant in Clinical Dermatology
Matthew Feldman, Assistant in Clinical Pediatrics
Jeanne E. Fenner, Assistant Professor of Clinical Pedia-
trics, Harlem Hospital
John J. Fenoglio, Assistant Professor of Pathology
Jose M. Ferrer, Associate Dean for Postgraduate Ed-
ucation
Harlow K. Fischman, Research Associate in Human
Genetics and Development
Brant E. Fries, Assistant Professor of Public Health
(Health Administration)
Pureza F. M. Gaerlan, Assistant Professor of Clinical
Pediatrics
Robert Galen, Assistant Professor of Pathology
Anna K. Gelman, Assistant Professor of Public Health
(Epidemiology)
Nette E. Gerda, Instructor in Clinical Pathology
Myron R. Gershberg, Assistant Clinical Professor of
Psychiatry

- Herbert Gerstein, Instructor in Clinical Radiology
Mohsen Ghaemmagham, Assistant in Clinical Medicine,
Delafield Hospital
Andrea-Camille V. Giardina, Instructor in Pediatrics
R. Suzanne Gibson, Instructor in Psychiatry, Mary
Imogene Bassett Hospital
Harold S. Ginsberg, Professor of Microbiology and
Chairman of the Department
Doris K. E. Goldberg, Assistant Clinical Professor of
Pediatrics
Eda G. Goldstein, Assistant in Clinical Psychiatry
Susan G. Gordon, Associate Professor of Clinical Pedi-
atrics
Peter Gorham, Instructor in Clinical Psychiatry
Martin E. Gorosh, Research Associate in International
Institute for the Study of Human Reproduction
William M. Green, Instructor in Clinical Radiology
Joseph Greenblum, Research Associate in Public Health
Erol O. Gursel, Instructor in Clinical Urology
Leonard C. Harber, Professor of Dermatology and
Chairman of the Department
Stephen E. Hefler, Research Associate in Pediatrics
Ernst Heilbrunn, Instructor in Anesthesiology
Joseph Heller, Assistant in Medicine
Alfred Hess, Instructor in Rehabilitation Medicine
Everett D. Hines, Research Associate in Public Health
(Health Administration)
Diane Hochlerin, Instructor in Pediatrics, St. Luke's
Hospital
Joel S. Hoffman, Instructor in Psychiatry
Ira A. Horowitz, Instructor in Radiology
William P. Isgreen, Assistant Professor of Clinical Neu-
rology
Elizabeth Jacob, Research Associate in Pathology
Jerome H. Jaffe, Professor of Psychiatry
William A. James, Assistant in Ophthalmology
Stanley J. Jasne, Research Associate in Biochemistry
Avtar S. Josen, Instructor in Surgery, Harlem Hospital
Patricia K. Kaelin, Research Associate in Nursing
Robert Emil Kanich, Instructor in Clinical Pathology,
Mary Imogene Bassett Hospital
Louis Katz, Research Associate in Cancer Research
Center
Norman S. Katz, Instructor in Clinical Pediatrics
Stuart L. Keill, Assistant Clinical Professor of Psychiatry
Hans-Jorg Keim, Research Associate in Medicine
Anne E. Kellett, Associate in Clinical Nursing
Otto F. Kernberg, Professor of Clinical Psychiatry
Yusuf Khakoo, Assistant Professor of Clinical Pediatrics
Jeanne Kobritz, Instructor in Clinical Nursing, Roosevelt
Hospital
Shoshana Ladany, Research Associate in Obstetrics and
Gynecology
Coral A. Lamartiniere, Research Associate in Obstetrics
and Gynecology, Roosevelt Hospital
Margaret M. Lawrence, Assistant Clinical Professor of
Psychiatry
Mary M. L. Lee, Assistant Professor of Anatomy
Nathan Lefkowitz, Lecturer in School of Public Health
Ting-I Li, Research Associate in Medicine
Violet Lippman, Research Associate in Obstetrics and
Gynecology
Melvina J. Lohmann, Instructor in Nursing
Ronald B. Lonesome, Instructor in Psychiatry
Gifford Y. Y. Lum, Instructor in Clinical Pathology
Kazimierz Malinowski, Research Associate in Ophthal-
mology
Hildegard Maricq, Research Associate in Medicine
Barry Richard Masters, Research Associate in Psychiatry
Irene C. McEachen, Instructor in Nursing, St. Luke's
Hospital
Mark G. McNamee, Research Associate in Neurology
Mario J. Merlino, Research Associate in Pediatrics
Bonnie B. Meskin, Research Associate in Psychiatry
Beatrice Mintz, Assistant Professor of Public Health
(Administrative Medicine)
Kokila Mody, Research Associate in Pharmacology
Irwin Mohr, Associate in Pediatrics
Bobba J. Moody, Assistant in Clinical Psychiatry
Gloria V. Moore, Research Associate in Nutrition
Damyanti G. Moorjani, Instructor in Rehabilitation
Medicine
Stanley G. Morrison, Instructor in Pediatrics
June Mulvaney, Instructor in Clinical Pediatrics, Har-
lem Hospital
Claude J. Neptune, Instructor in Clinical Pathology
Grace M. Nespoli, Associate in Clinical Nursing
Edward A. Nichols, Instructor in Pediatrics, St. Luke's
Hospital
Ingrid G. Noske, Research Associate in Obstetrics and
Gynecology
William Laubach Nute, Jr., Adjunct Assistant Professor
of Public Health (Health Administration)
Lois Elinor Oksenberg, Research Associate in Psychiatry
John James Olichney, Instructor in Clinical Medicine,
Roosevelt Hospital
Morton Orentlicher, Research Associate in Neurology
Celia Ores, Assistant Professor of Clinical Pediatrics
Lida Orzeck, Research Associate in Public Health (Epi-
demiology)
Louis Padovano, Instructor in Psychiatry, St. Luke's
Hospital
Mohamad H. Parsa, Instructor in Surgery
Audrey S. Penn, Associate Professor of Neurology
Miercio Pereira, Research Associate in Microbiology
Samuel Wesley Perry, III, Associate in Clinical Psy-
chiatry
Ruth D. Peters, Assistant in Clinical Pediatrics
Roy H. Petrie, Assistant Professor of Obstetrics and
Gynecology
Stephanie Phillips, Research Associate in Human Ge-
netics and Development
Constantine Photos, Instructor in Urology
Marcia L. Pinkett, Instructor in Public Health (Health
Administration)
Jane Pitt, Associate in Pediatrics
Charles Robert Plank, Research Associate in Pharma-
cology, Harlem Hospital
Maureen Poh, Assistant Professor of Dermatology
William N. Poillon, Research Associate in Medicine, St.
Luke's Hospital
Irwin J. Polk, Assistant Clinical Professor of Pediatrics
St. Luke's Hospital
Edward J. Pollock, Instructor in Radiology
Ajai Prakash, Research Associate in Pharmacology
Frederick Bates Putney, Assistant Professor of Publi-
Health (Health Administration)
Rajasekhar Ramakrishnan, Research Associate in Med-
icine
Lance D. Redler, Assistant in Clinical Ophthalmology

Robert M. Reiss, Assistant Clinical Professor of Orthopedic Surgery
 Banyard D. Richard, Assistant in Clinical Ophthalmology
 Mary R. Richards, Instructor in Pediatrics
 Julio M. Garcia Rodriguez, Instructor in Clinical Anesthesiology, St. Luke's Hospital
 Joel A. Rind, Instructor in Clinical Pathology
 Lewis P. Rowland, Professor of Neurology and Chairman of the Department
 Kyuon Hwan Ryu, Research Associate in International Institute for the Study of Human Reproduction
 Leroy S. Safian, Instructor in Diagnostic Radiology, Francis Delafield Hospital
 Leon Salzman, Lecturer in Psychiatry
 Phyllis M. Sampson, Research Associate in Medicine
 Margaret J. Sandelowski, Associate in Clinical Nursing
 Ben T. Sandler, Research Associate in Surgery
 Paul Sane, Instructor in Radiology
 Sadhana Sharad Sathe, Research Associate in Pharmacology
 James Frank Schauble, Research Associate in Anesthesiology
 Israel Schechter, Research Associate in Cancer Research
 Dora H. Schively, Assistant in Clinical Neurology
 Eugene P. Schoener, Research Associate in Pharmacology
 Peter M. Scholz, Research Associate in Physiology
 Alan Martin Sear, Research Associate in International Institute for Study of Human Reproduction
 Beatrice Carrier Seegal, Special Lecturer in Microbiology
 Morton J. Seligman, Instructor in Pediatrics
 Narayan R. Shah, Associate in Pediatrics
 Sheila A. Shanahan, Instructor in Pediatrics
 Beth E. Shapiro, Instructor in Clinical Nursing
 Pradeep Sharma, Assistant in Pediatrics
 Thomas E. Shaw, Instructor in Surgery
 Glenn Keith Sherer, Research Associate in Medicine
 William H. Sherman, Research Associate in Cancer Research
 Lillie M. Shortridge, Associate in Clinical Nursing
 Michael Shostak, Instructor in Psychiatry
 Athalia E. Siegmann, Assistant in Public Health (Health Administration)
 Robert Silbey, Instructor in Radiology
 Beth Silverman, Assistant in Clinical Psychiatry
 Eleanor Singer, Research Associate in Psychiatry
 Arthur M. Smith, Assistant Professor of Clinical Urology
 David Melvin Smith, Instructor in Clinical Orthopedic Surgery
 Stuart R. Snider, Assistant Professor of Neurology
 Martha M. Sorenson, Research Associate in Neurology
 Balachandran D. Srinivasan, Assistant in Clinical Ophthalmology
 Raymond I. Stark, Research Associate in Pediatrics
 Anne Stein, Instructor in Nursing
 Zena A. Stein, Associate Professor of Public Health (Epidemiology)
 Robert Stone, Instructor in Rehabilitation Medicine
 Arumbi P. Subramanian, Assistant in Urology, St. Luke's Hospital
 Rudolph D. Talarico, Instructor in Urology

Prem Prasad Talwar, Research Associate in International Institute for the Study of Human Reproduction
 Phienvit Tantibhedhyangkul, Assistant Clinical Professor of Pediatrics, St. Luke's Hospital
 Joseph V. Terenzio, Adjunct Professor of Public Health (Health Administration)
 Philip W. Thieman, Instructor in Surgery
 Pellegrino J. Tozzo, Instructor in Urology, St. Luke's Hospital
 Nestor J. Truccone, Research Associate in Pediatrics
 Chou Tsui-Chin, Research Associate in Pharmacology
 Naomi Lorraine Turner, Associate in Rehabilitation Medicine
 Melvin M. Udel, Instructor in Psychiatry, St. Luke's Hospital
 Pisan Unchalipongse, Instructor in Obstetrics and Gynecology
 Elo Urm, Research Associate in Pathology
 Leos G. Veprek, Research Associate in Cancer Research
 Michael Viola, Research Associate in Institute of Cancer Research
 Barbara Cordes Von Bulow, Assistant in Clinical Psychiatry
 Patrick M. Walsh, Instructor in Psychiatry
 Thaddeus L. Wandel, Assistant in Ophthalmology
 Michael H. Wechsler, Assistant Professor of Urology
 Harvey Weinberg, Assistant in Clinical Dermatology
 Anthony Eric Wickremesinghe, Instructor, Assistant Anesthesiologist
 Sally Wiseley, Instructor in Clinical Rehabilitation Medicine
 Janet Wittes, Adjunct Assistant Professor of Public Health (Epidemiology)
 David Wolfers, Research Associate in International Institute for Study of Human Reproduction
 Flemming Wollesen, Associate in Clinical Obstetrics and Gynecology
 Carolyn Wrubel, Instructor in Nursing
 Joseph Chuan-Shih Yang, Instructor in Anesthesiology, Delafield Hospital
 Hong Chui Yoon, Instructor in Anesthesiology
 Ian Mark Yudelman, Research Associate in Medicine
 Elizabeth B. Zdibak, Associate in Clinical Nursing
 Philip R. Ziring, Assistant Professor of Pediatrics, Roosevelt Hospital

Prizes

The Janeway Prize, awarded to the graduate who, in the opinion of the Faculty, has ranked highest in efficiency and ability was given to Elliott B. Grossbard. William M. Sherman received the Frederick P. Gay Memorial Award. James D. Boyce, Richard A. Saunders, and Jaime Santamaria received the Alvin Behrens Memorial Fund Award. Vincent P. Butler, Class of 1954, received the Joseph Mather Smith Prize, which is given to the graduate whose essay or original research in medical subjects is deemed by the Committee on Awards to be the most meritorious.

The William Perry Watson Prize in Pediatrics was awarded to Douglas A. Dransfield. The Harold Lee

Meierhof Memorial Prize in Pathology was given to Philip Altman. The Joseph Garrison Parker Award was given to Edward B. Leahey, Jr., Sharon F. Grundfest, and Yvonne S. Thornton. The Walter Wincheste Prize was given to Marion A. Bruen and Douglas A. Dransfield. The Urology Prize was given to William L. Barnard, Jr., Peter R. Hoffmann, Robert B. Santulli, and Donald A. Trelstad.

The Alumni Association Award was given to David T. K. Chiu and David H. Finley. The Margaret Eliot Prize in Nursing was given to Ellen Rita Wojtow. The Arlene Myers Prize in Nursing was given to Veronica Lee Arikian.

The Doctor Harry S. Altman Award was given to John Straus. Donald R. Mattison received the Thomas F. Cock Prize. The Roche Award was given to John Gregory Mears. The Doctor Harold B. Stevelman Award was given to Jeffrey A. Whitsett. The Upjohn Achievement Award was given to Robert J. Mascitelli. John W. Lombardo received the Doctor William Raynor Watson Prize.

Personnel Health Service

The Personnel Health Service has continued to be directed by Dr. Marshall Primack, assisted by Dr. Frank Smith. Dr. J. Kirby Cunningham has continued to perform radiation and pre-employment physical examinations.

During the 10-month period, January 1–October 31, 1973, 2,541 patient visits were made (as compared with 2,854 patient visits during the previous 12-month period). These included 2,256 office visits and 285 physical examinations (of 51 new employees and of 234 radiation safety employees, the latter figure including new employees).

Additional services provided comprised annual physical examinations, x-rays, and laboratory tests for dietitians, animal caretakers, and employees exposed to pathogenic substances, premarital examinations, allergy injections for employees and students, immunizations, Snellen eye tests for driver-license renewals, and completion of health reports and insurance forms.

Student Health Service

The following reports includes the activities of the Student Health Service for the Academic Year 1972-73, under the direction of Albert R. Lamb, Jr., M.D. During this period the office has been located on the 20th floor of the Black Building, having been moved to these quarters in September, 1971.

Medical care has continued to be provided for all Columbia University students studying full-time at

the Medical Center, excepting the undergraduate student nurses. This represents slightly over 1,000 students—medical, dental, occupational therapy, physical therapy, dental hygiene, public health, graduate dental, graduate nursing and a large number of Ph.D. candidates in Biochemistry, Anatomy, Microbiology, Physiology, Human Genetics, Pathology, etc.

The number of office visits for medical care, 2,817, is similar to that for last year (2,835). In addition, physical examinations were performed on incoming students in Medicine, Dentistry, Dental Hygiene, Physical Therapy, and Occupational Therapy, and chest x-rays were obtained as indicated. A total of 305 physical examinations were performed and 379 chest x-rays taken.

There were 1,698 visits to various areas in Vanderbilt Clinic. Nineteen medical students, 1 dental student, 1 dental hygiene student, 2 occupational therapy students, and 1 physical therapy student were hospitalized during the year.

The table shows the distribution by student categories of office visits to the Health Service during the past two years:

	1971-72	1972-73
Medical—1st year students	354	562
2nd year students	362	358
3rd year students	295	255
4th year students	342	310
Total	1353	1485
Student wives	184	122
Dental — 1st year students	133	117
2nd year students	144	132
3rd year students	135	113
4th year students	113	93
Graduate dental students	72	76
Dental hygiene students	136	158
Occupational therapy students	126	148
Physical therapy students	95	83
Public health students	95	61
Graduate students	249	229
TOTAL	2835	2817

Audiovisual Service

The Audiovisual Service of the College of Physicians and Surgeons, under the guidance of William H. Unger, Director, and Linda DuKore, Production Director, continues to support the Faculty of Medicine's efforts in undergraduate and continuing medical education with the use of new technology and multimedia materials in the classroom and the self study student carrel. The growth of the Service has

been moderate but steady, and the outlook for further expansion is promising.

The Service's efforts have included advice to individuals and departments attempting to generate new instructional materials and techniques; the design of new audiovisual facilities and supervision of their construction; media service, i.e., providing equipment and personnel to support teaching activities; and development of a graphics design, photographic, and television production division.

Although its staffing is modest, the Audiovisual Service has made good progress in developing technical and creative expertise and in establishing good liaison with the departments. It serves increasing numbers of the medical faculty and has produced a large volume of instructional material. The television facility can produce patient interviews, panel discussions, lectures, simple demonstrations of medical, nursing, and dental procedures and limited operating room photography. To date, more than 20 programs have been produced and made available in videocassette format to students and faculty here and in other medical institutions. Medical colleagues elsewhere have commented positively on our programs.

The multimedia production facility planned for the Augustus Long Library—Health Sciences Center

will enlarge the Service's staff and service capacity and help expand production to meet increasing needs. A much more sophisticated television facility is being designed for the new building, and the addition of a flexible and rapid-access Super-8 film support unit will complement television production and increase program possibilities. In addition to supporting teaching functions in the Medical School and the Health Sciences Division of the University these new facilities will greatly enhance further efforts in continuing education and may find application in health care delivery. Future goals include broadcast-type facilities, a satellite studio near the clinical areas, transmission equipment to disseminate information via cable to the community, and the development of a medical network for institutional exchange throughout city, state, and nation.

Respectfully submitted,



DONALD F. TAPLEY, M.D.
*Acting Dean of the
Faculty of Medicine*

December 31, 1973

FACULTY OF MEDICINE

1969-70 to 1973-74

FULL-TIME	1973-74	1972-73	1971-72	1970-71	1969-70
<i>Without Stated Term</i>					
Professor	140	145	130	128	124
Professor of Clinical	11	6	3	2	2
Associate Professor	62	48	41	56	63
Associate Professor of Clinical	15	5	—	—	—
	<u>228</u>	<u>204</u>	<u>174</u>	<u>186</u>	<u>189</u>
<i>Annual</i>					
Professor	4	7	10	3	3
Professor of Clinical	2	0	2	1	1
Clinical Professor	1	1	1	1	0
Adjunct Professor	2	0	0	0	0
Associate Professor	42	45	54	26	10
Associate Professor of Clinical	12	6	3	0	1
Associate Clinical Professor	2	2	4	0	2
Adjunct Associate Professor	1	0	0	0	0
Senior Research Associate	9	4	—	—	—
Assistant Professor	173	200	202	198	157
Assistant Professor of Clinical	22	19	5	5	6
Assistant Clinical Professor	14	12	8	4	12
Adjunct Assistant Professor	3	0	0	0	0
Associate	43	61	66	54	49
Research Associate	130	142	131	127	123
Instructor	50	84	76	83	83
Assistant	9	19	34	59	57
Special Lecturer	5	6	7	8	6
Lecturer	1	0	0	0	0
Visiting Professor	2	3	1	3	3
Visiting Associate Professor	0	4	1	0	3
Visiting Assistant Professor	1	1	1	0	1
Visiting Instructor	0	0	0	1	1
Visiting Lecturer	0	1	0	0	0
	<u>528</u>	<u>617</u>	<u>606</u>	<u>573</u>	<u>516</u>
TOTAL FULL-TIME	756	821	780	759	705
PART-TIME					
<i>Without Stated Term</i>					
Professor	16	0	0	0	0
Professor of Clinical	45	31	30	31	25
Associate Professor	9	7	—	—	—
Associate Professor of Clinical	37	50	45	48	38
	<u>107</u>	<u>88</u>	<u>75</u>	<u>79</u>	<u>63</u>
<i>Annual</i>					
Professor	1	0	0	1	0
Professor of Clinical	2	2	2	0	0
Clinical Professor	31	36	40	42	43
Adjunct Professor	19	16	16	15	11
Associate Professor	2	0	0	1	1
Associate Professor of Clinical	10	8	7	0	1
Associate Clinical Professor	83	102	102	100	89
Adjunct Associate Professor	14	14	12	13	13
Senior Research Associate	1	2	—	—	—
Assistant Professor	36	24	27	18	42
Assistant Professor of Clinical	123	60	46	29	29
Assistant Clinical Professor	267	286	214	180	113
Adjunct Assistant Professor	34	29	30	19	0
Associate	201	199	197	192	228
Research Associate	61	33	40	38	49
Instructor	321	317	289	275	292
Assistant	106	103	93	83	92
Research Assistant	0	0	1	1	1
Special Lecturer	28	25	25	26	33
Lecturer	99	115	123	120	114
Visiting Professor	2	2	1	2	6
Visiting Associate Professor	0	0	0	0	2
Visiting Assistant Professor	1	0	1	0	0
Visiting Lecturer	0	0	0	1	0
	<u>1,442</u>	<u>1,373</u>	<u>1,266</u>	<u>1,156</u>	<u>1,159</u>
TOTAL PART-TIME	1,549	1,461	1,341	1,235	1,222
GRAND TOTALS	<u>2,305</u>	<u>2,282</u>	<u>2,121</u>	<u>1,994</u>	<u>1,927</u>

FACULTY OF MEDICINE

1973-74

ASIC SCIENCE DEPARTMENTS	<i>Full-time</i>	<i>Part-time</i>	<i>Total</i>
anatomy	20	4	24
iochemistry	33	18	51
uman Genetics	27	7	34
icrobiology	22	4	26
athology	52	81	133
armacology	20	9	29
hysiology	19		19
	<u>193</u>	<u>123</u>	<u>316</u>
CLINICAL DEPARTMENTS			
nesthesiology	35	35	70
ermatology	9	29	38
edicine	112	229	341
eurological Surgery	3	14	17
eurology	43	37	80
bstetrics and Gynecology	39	53	92
phthalmology	17	41	58
rthopedic Surgery	4	39	43
tolaryngology	3	28	31
ediatrics	75	122	197
ychiatry	8	420	428
adiology	29	50	79
ehabilitation Medicine	27	21	48
urgery	36	111	147
rology	6	47	53
	<u>446</u>	<u>1,276</u>	<u>1,722</u>
ursing	45	24	69
ublic Health	72	126	198
GRAND TOTAL	<u>756</u>	<u>1,549</u>	<u>2,305</u>

Reports of Departments
and Services

Anatomy

EDWARD W. DEMPSEY

Professor and Chairman of the Department

Previous Annual Reports have mentioned the outstanding accomplishments, and also the problems, of the Department of Anatomy. This report, marking the end of the present Chairman's administration, will summarize these matters.

In discussions with the Dean prior to assuming the Chairmanship, it was agreed that the Department was understaffed and underpaid and needed additional facilities. Efforts to remedy these matters resulted in the addition of six staff members, in salary increases averaging more than one-third, in physical renovation of about 6000 sq. ft. of space at a cost of approximately \$100,000, and in acquisition of new equipment valued at more than \$300,000. Previous research had largely been concerned with studies of the nervous system; these were continued energetically, and in addition, active programs in the physiology of reproduction, cellular biology and physical anthropology were initiated. Support for the Department's various activities was obtained from a larger number of sources, and in greater amounts, than previously. Our participation in extradepartmental activities, as measured by requests to serve as consultants on external committees, and our collaborations with other departments (with 42 individuals located in 21 departments), both reached all-time highs.

On the other hand, certain other problems now occasion concern. The necessary restrictions in University budgets and the decreased availability of grant funds have affected the Department's ability to expand further. It has not been possible to replace

four senior staff members who left because of death, retirement, or resignation. The reorganization of the curriculum required to provide for changing needs in medical education has necessitated rearrangement of teaching schedules and substantial investment of time in preparing syllabi, laboratory directions, and audiovisual teaching materials. The transfer of responsibility for teaching subjects traditionally located in Anatomy (Embryology to the Department of Genetics and Human Development and, prospectively, Neuroanatomy to the Department of Physiology) has also contributed to uncertainty as to the future directions the Department will take.

Teaching

With the prospects both of a curriculum revision next year and of a new Chairman of the Department it was decided to alter Anatomy courses as little as possible during the current year. Continued shortage of cadavers for teaching Gross Anatomy and of scheduled time for Microscopic Anatomy and Neuroanatomy have led to increased reliance upon audiovisual aids in all three courses. The exigencies of the shortened schedule have again caused us to revise the laboratory directions and course syllabi to increase efficiency.

Research

The research activities mentioned in last year's report have for the most part continued. Dr. Margaret Murray's program has been terminated by her retirement; she now works in the N.I.H. laboratories in

Bethesda. Other reductions in the Department's total research effort have resulted from the resignations of Dr. George Cooper, who accepted a position at Cornell, and of Dr. Robert Hunt, who has gone to the University of Nebraska.

Dr. Mary Lee, who joined the staff as Assistant Professor upon completion of her doctoral degree, has undertaken an investigation of the microcirculation of various organs and ultrastructural investigations utilizing freeze-fracture techniques. Computer-assisted studies of nervous activities have progressed under Dr. Philip Brandt's collaborations with various members of the Department of Neurology. Further developments in the field of microanalysis of elements in ultrastructural locations have been made by Dr. Edward Dempsey, who has engaged in collaborations with Drs. Frederic J. Agate, Jr., Mary Lee, and Gerard Pereira in this department, Mabel Purkerson of Washington University, Shu Chien (Physiology), Robert L. Waldron (Radiology), and Myron Tannenbaum (Pathology, Urology). In addition to these activities, progress has continued along the lines mentioned in last year's report in the neurological studies of Drs. Malcolm Carpenter, Charles Noback, and D. Rivera-Dominguez; in the studies on the development of the eye by Dr. George Smelser and

collaborators; in the work on hard tissues by Drs. Melvin Moss and Letty Moss-Salentijn; and in the construction of a laboratory for low-angle x-ray diffraction by Dr. Ernest April. Support for work carried out by the younger staff has continued from the Cancer Research Center to Dr. William Dilley, from the Population Council to Dr. W. P. Luckett, from the American Philosophical Society to Dr. John Rasweiler for his studies on reproduction in bats, and from the N.I.H. to Dr. Gerard Pereira for his investigations of immunity in germ-free animals.

Acknowledgments

As in past years, our research has been made possible by funds provided by many public and private agencies. We have received aid from the Sinsheimer Fund, the Lillia Babbit Hyde Foundation, and the Foundation for Child Development. The Population Council and the American Philosophical Society have provided grants-in-aid. The Upjohn Company and Hoffman LaRoche have made gifts toward the support of various investigations. We have received grants from several of the National Institutes of Health. To all of these agencies we express our gratitude.

1973 Publications

Anatomy

- April, Ernest W. and Brandt, Philip W.
The myofilament lattice: Studies on isolated fibers. III. The effect of myofilament spacing upon tension. *J. Gen. Physiol.* **61**:490-508, 1973.
- Azar, Henry A.; Zaino, Edward C.; Pham, Tuan Duc and Yannopoulos, Katie
"Nonsecretory" plasma cell myeloma: Observations on seven cases with electron microscopic studies. *Am. J. Clin. Path.* **58**:618-629, 1972.
- Benitez, H. H.; Murray, M. R. and Cote, L. J.
Responses of sympathetic chain ganglia isolated in organotypic culture to agents affecting adrenergic neurons: Fluorescence histochemistry. *Exper. Neurol.* **39**: 424-448, 1973.
- Carpenter, Malcolm B.
Comparisons of the efferent projections of the globus pallidus and substantia nigra in the monkey. In: *Somatomotor Integration: A Multidisciplinary Approach*. J. D. Maser, ed. Academic Press, New York, 1973. Chap. 5, pp. 137-174.
- The peripheral nervous system. In: *Encyclopedia Britannica*. Encyclopedia Britannica Inc., Chicago, Ill., 1973.
- Carpenter, Malcolm B. and Pierson, Roberta J.
Pretectal region and the pupillary light reflex. An anatomical analysis in the monkey. *J. Comp. Neurol.* **149**: 271-300, 1973.
- Carpenter, Malcolm B.; Stein, Bennett M. and Peter, P.
Primary vestibulocerebellar fibers in the monkey: Distribution of fibers arising from distinctive cell groups of the vestibular ganglia. *Am. J. Anat.* **135**:221-250, 1972.
- Cramer, E. B. and Ely, C. A.
Release and absorption in stimulated gonadotrophs as revealed by horseradish peroxidase. *Anat. Rec.* **175**: 298, 1973.
- Dempsey, Edward W.
Ultrastructure of the placenta: Consequences for drug distribution. In: *Fetal Pharmacology*. L. Boreus, ed. Raven Press, New York, 1973. pp. 41-45.
- Neural and vascular ultrastructure of the area postrema in the rat. *J. Comp. Neurol.* **150**:177-200, 1973.
- Dempsey, Edward W.; Agate, F. J.; Lee, M. and Purkerson, M. L.
Analysis of submicroscopic structures by their emitted X-rays. *J. Histochem. & Cytochem.* **21**:580-586, 1973.

- Fenoglio, John J.; Pham, Tuan Duc.; Wit, Andrew L.; Bassett, Arthur L. and Wagner, Bernard M.
Canine mitral complex. Ultrastructure and electromechanical properties. *Circulation Res.* 31:417-430, 1972.
- Henrikson, Ray C.
Ultrastructural aspects of mouse cecal epithelium. *Z. Zellforsch.* 140:445-449, 1973.
- Kuo, Jon-Son
The organization of pallidothalamic projections in the rhesus monkey. *Anat. Rec.* 175:365, 1973.
- Lee, M. L.; Purkerson, M. L.; Agate, F. J., Jr. and Dempsey, E. W.
Ultrastructural changes in renal glomeruli of rats during experimentally induced hypertension and uremia. *Am. J. Anat.* 135:191-205, 1972.
- Luckett, W. P.
Amniogenesis in the early human and rhesus monkey embryos. *Anat. Rec.* 175:375, 1973.
- Moss, M. L.
An introduction to the neurobiology of oro-facial growth. *Acta Biotheoret.* 22:236-259, 1972.
The regulation of skeletal growth. In: *Regulation of Organ and Tissue Growth*. R. Goss ed. Academic Press, New York, 1972, pp. 127-142.
Functional cranial analysis and the functional matrix. In: *Morphology of the Maxillo-Mandibular Apparatus*, G.-H. Schumacher, ed. VEB G. Thieme, Leipzig, 1973, pp. 160-165.
Funktionelle Schodelanalyse und die funktionelle matrix. *Fortschr. Kieferorthop.* 57:5-16, 1973.
A functional cranial analysis of primate craniofacial growth. In: *IV Int'l. Cong. Primatol., Cranio-Facial Biology*. Karger, Basel, 3:191-208, 1973.
- Moss-Salentijn, Letty and Moss, Melvin L.
(Tooth) enamel. In: *Encyclopedia of Microscopy and Microtechnique*. Peter Gray, ed. Van Nostrand Reinhold Publishing Company, New York, 1973.
- Noback, Charles R.
Comments on the visual pathways. In: *Corticothalamic Projections and Sensorimotor Activities*. T. L. Frigyesi, E. Rinvik, and M. D. Yahr, eds. Raven Press, New York, 1973, pp. 485-489.
- Noback, Charles R. and Mettler, Fred A.
Centrifugal fibers to the retina in rhesus monkey. *Brain, Behavior and Evolution*, 7:382-399, 1973.
- Pereira, G. and Dempsey, E. W.
Ultrastructure of the reticular cells of the spleen of conventional and germfree rats. *Anat. Rec.* 175:409-410, 1973.
- Pierson, Roberta J. and Carpenter, Malcolm B.
Pretectal region and the pupillary light reflex in the monkey. *Anat. Rec.* 175:413, 1973.
- Rasweiler, J. J. IV
The care and management of the long-tongued bat, *Glossophaga soricina* (Chiroptera: Phyllostomatidae) in the laboratory, with observations on estivation induced by food deprivation. *J. Mamm.* 54:391-404, 1973.
- Rasweiler, J. J., IV and Ishiyama, V.
Maintaining frugivorous phyllostomatid bats in the laboratory: *Phyllostomus*, *Artibeus* and *Sturnira*. *Lab. Anim. Sc.* 23:56-61, 1973.
- Schwartz, N. B.; Krone, K.; Talley, W. L. and Ely, C. A.
Administration of antiserum to ovine FSH in the female rat: Failure to influence immediate events of cycle. *Endocrinology* 92:1165, 1973.
- Simon, M. and Moss, M. L.
Dynamics of sigmoid notch configuration and its relationship to total normal morphology. *Acta Anat.* 85:133-144, 1973.
- Waldron, Robert L.; Bridenbaugh, Richard; Purkerson, Mabel and Dempsey, Edward W.
The effect of angiographic contrast media at the cellular level in the brain. *Radiology* 108:187-189, 1973.

Anesthesiology

HENRIK H. BENDIXEN

Professor and Chairman of the Department • Director of Service

Staff Changes and Honors

Effective September 1, 1973, Dr. Henrik H. Bendixen succeeded Dr. S. H. Ngai as Chairman of the Department. Dr. Ngai is assuming responsibility for coordination of research activities within the department. Drs. Eliezer Ronen and Anthony E. Wickresinghe joined the attending staff, as well as Drs. Bernard Filner, Raymond B. Laravuso, and James B. Schauble.

On July 1, 1973, Dr. Ronald L. Katz moved to the University of California at Los Angeles to become Professor and Chairman of the Department of Anesthesiology. Drs. Stuart F. Sullivan, Richard W. Patterson, Jordan Miller, and Herman Schwartz also left the department to join Dr. Katz. Drs. Alan N. Rachleff and Lynne T. Greene left the department during the year to go into private practice in New York State.

At the Harlem Hospital, Dr. Herbert G. Cave, Director of the Department of Anesthesiology, is President of the Medical Board and Chairman of the Board's Executive Committee. Dr. Kentaro Tsueda resigned, and Dr. Saidel Laine joined the Department as an Clinical Fellow.

At the Francis Delafield Hospital Dr. Jean Henley retired as Director in January; Dr. Veronica Bakamian, Assistant Director, was appointed Director in her place. Dr. Joseph S. Yang joined the staff as Associate Director.

At the Mary Imogene Bassett Hospital Dr. William F. Karl continues as Director of the Department; there were no staff changes during the year.

Dr. Richard L. Keenan, Director of the Department at the Roosevelt Hospital, was joined on the attending staff by Drs. H. C. Lee and Terence Murphy. Dr. Keenan is a member of the Committee on Hospital Planning and Construction of the American Society of Anesthesiologists and a member of the New York State Society of Anesthesiologists Committee on Critical Care.

At St. Luke's Hospital, Dr. Julio M. Garcia-Rodriguez joined the attending staff. Dr. Louis S. Blancato, Director of the Department, is President-Elect of the New York State Society of Anesthesiologists and Treasurer of the American Society of Anesthesiologists.

At the Presbyterian Hospital, Dr. Bendixen is President-Elect of the Society for Critical Care Medicine. Dr. Ngai continues as an editor of *Anesthesiology*, serves on the Editorial Advisory Board of *Neuropharmacology*, and is Chairman of the Section on Anesthesiology and Resuscitation of the New York Academy of Medicine. Dr. Gabriel G. Nahas served as Consultant to the United Nations Commission on Narcotics, as a Consultant to the French Ministry of Health Committee on Drug Education, and as Co-chairman of the Fifth European Postgraduate Course in Anesthesia. Dr. Ernest Salanitro was an invited lecturer at the First International Seminar on the Physiological Basis of Anesthesiology, sponsored by the Fondazione Giovanni Lorenzini of Milano. Dr. Salanitro spent his sabbatical on campus working with Mr. Arnold St. J. Lee to develop a method for electromyographic measure-

ment and worked on a book on pediatric anesthesia. Dr. Lester C. Mark is on a Food and Drug Administration panel on drug review and is Chairman of the Program Committee of the Postgraduate Assembly of the New York State Society of Anesthesiologists. Dr. Mark completed his term on the Executive Committee of the Clinical Pharmacology Division, American Society of Pharmacology and Experimental Therapeutics.

Dr. Allen I. Hyman was a Visiting Professor of Anesthesiology at the University of Mexico and served as Program Chairman of the Section on Anesthesiology of the American Academy of Pediatrics; he also served on the Committee on Medical Devices of the American Academy of Pediatrics and on the American National Standards Institute Committee. Dr. Richard S. Matteo spent his sabbatical leave working at the Roche Institute of Molecular Biology with Dr. Sidney Spector to develop radioimmunoassays for muscle relaxant drugs. Dr. Leonard Brand continues to serve as the Consultant to the Veterans Administration Hospital in East Orange, New Jersey and on the Editorial Board and the Scientific Program Committee of the publication of the New York State Society of Anesthesiologists.

Dr. M. Finster was elected to the American Society for Pharmacology and Experimental Therapeutics, and to Associate Fellowship of the American College of Obstetricians and Gynecologists. Dr. Paul J. Poppers was appointed Chairman of the Scientific Program Committee of the New York State Society of Anesthesiologists, and Visiting Scientist in the Department of Biochemistry and Drug Metabolism, Research Division, Hoffmann-La Roche, Inc., Nutley, New Jersey.

Teaching

The introductory course in anesthesiology for medical students continues as in previous years. In addition to the standard clerkship in anesthesiology, the Department now offers an advanced clinical clerkship as well as elective courses in neonatal, pediatric, and adult respiratory and intensive care. Members of the Department participate in teaching nursing staff and paramedical personnel.

Research

Dr. Ngai continued to study brain monoamines in relation to the central nervous system toxicity of hyperbaric oxygenation. With Dr. David H. Sprague, Dr. Ngai studied cyclic AMP formation in aortic strips *in vitro* under halothane, isoflurane, or cyclopropane anesthesia. Dr. Ngai is also working with Drs. Sidney Spector and Wallace Dainman of the

Roche Institute of Molecular Biology, studying the action of local anesthetics on catecholamine synthesizing enzymes, and changes in serum and lymph concentrations of dopamine-beta-hydroxylase upon sympathoadrenal activation.

Dr. L. Stanley James has been working with Drs. H. O. Morishima, M. Finster, P. J. Poppers, S. Daniel, R. S. Matteo, and L. C. Mark on projects including fetal monitoring, fluid and electrolyte balance and renal function in the fetus, the response of the fetal autonomic nervous system, placental transfer of drugs, radioimmunoassay of drugs, and drug distribution and metabolism in mother and fetus.

Dr. Gabriel G. Nahas is working with Drs. N. Suci-Foca, J. P. Armand, and A. Morishima to study the mechanism by which marijuana products inhibit blastogenesis, cell replication, and DNA synthesis in animal and man. Dr. Nahas is also working with Drs. G. A. Hyman and D. V. Habib to determine an index of osmotic erythrocyte fragility, and with Dr. J. McAllister, H. Boccalon and Mr. P. Berryer to produce a noninvasive blood flow monitoring device.

Drs. L. C. Mark and L. Brand continue their studies on drug distribution and metabolism, including pharmacokinetics and stereoisomers. They also continue to cooperate with the perinatology group in studies of drug metabolism.

Drs. H. Rackow and E. Salanitro continue their studies of uptake and elimination of anesthetics in children and are working on a method for measuring electromyographic responses in children, permitting the study of muscle-relaxing drug effect.

Drs. A. I. Hyman and R. A. Epstein developed a system of mechanical ventilation for use in newborns permitting respiratory function measurements which hitherto could not be obtained. They are also working with members of the Department of Pediatrics on new methods for maintaining airway pressure in infants with respiratory distress syndrome and on studies of the determinants of transcapillary fluid balance in the lung; Dr. Epstein participated in study of the relationships of electroencephalogram staged sleep with ventilation in normal infants.

Dr. H. J. Khambatta continues his work to determine the carbon dioxide stores of the body, focusing on the body carbon dioxide washout during respiratory alkalosis. He has been cooperating with Dr. Robert T. Donham and J. Gilbert Stone in comparing methods for induced hypotension during surgery and anesthesia.

Dr. J. Gilbert Stone is studying ventilation-perfusion problems of the lung, examining the effect of alveolar hypoventilation and shunting. Dr. Stone is

also studying pulmonary shunting during open heart surgery.

Dr. R. S. Matteo has been working with Dr. Sidney Spector on a radioimmunoassay method for d-tubocurarine. This work when presented at the annual meeting of the American Society of Anesthesiologists was received as a major advance.

Dr. Eugene J. Pantuck continued his work with Drs. Ronald Kuntzman and A. H. Conney on enzyme induction and drug metabolism.

Dr. Lubos Triner is working on the role of cyclic AMP in smooth muscle function, examining the interaction of the cyclic AMP system with anesthetics and vasoactive agents.

Dr. Joseph Yang continues to work with Dr. Ngai on brain amines and hyperbaric oxygenation toxicity and is participating in studies of acupuncture and hypnosis. Research on acupuncture is also carried out at the St. Luke's Hospital under the direction of Dr. Blancato and at Roosevelt Hospital by Drs. R. L. Keenan and I. Ngo.

Acknowledgment

The Department gratefully acknowledges the generous support of its teaching and research program by the National Institute of General Medical Sciences, National Science Foundation, New York City Health Research Council, Astra Pharmaceutical Products, Ayerst Laboratories, Mr. Henri G. Doll, The Bob and Dolores Hope Charitable Foundation, the Morris and Rose Millstein Foundation, Hoffmann-La Roche, Inc., the Whitehall Foundation, and The Sinsheimer Foundation.

1973 Publications

Anesthesiology

Boccalon, H.; Berryer, P.; Malm, J. R.; Doll, H. G. and Nahas, G. G.

Post prandial increases of limb blood flow in normal man (Abstract). *Fed. Proc.* 32:425, 1973.

Brand, L.; Mark, L. C.; Heiber, S. and Perel, J. M.

Interaction between Diazepam and diphenylhydantoin (Abstract). *Abstr. Sci. Papers, ASA Ann. Mtg.*, 1973, p. 251.

Danilo, P.; Vulliemoz, Y.; Verosky, M. and Rosen, M. R.

Activation of cardiac purkinje fiber adenylyl cyclase by β -adrenergic amines (Abstract). *Fed. Proc.* 32:773, 1973.

Epstein, R. A. and Epstein, R. M.

The electromyogram and the mechanical response of indirectly stimulated muscle in anesthetized man following curarization. *Anesthesiology* 38:212, 1973.

Research activities at St. Luke's Hospital were supported by the Surdna Foundation, Irma T. Hirschil Trust, and the Department of Rehabilitation, St. Luke's Hospital.

Patient Care

In 1973, 19,551 patients were attended by the Anesthesiology Service. General anesthesia was administered to 15,717 patients, and regional anesthesia to 2,825. Consultations for resuscitation, diagnostic and therapeutic nerve blocks, and respiratory care were provided for inpatients and outpatients.

The Inhalation Therapy Service treated 9,960 patients in 1973; 801 patients received continuous mechanical ventilation for a total of 3,342 patient days.

Affiliated Hospitals

At the St. Luke's Hospital, anesthesia was administered to 10,800 patients. Roosevelt Hospital provided surgical anesthesia in 8,171, treated 160 patients in the Respiratory Care Unit, and performed 11,092 determinations in the acid-base laboratory. Francis Delafield Hospital administered 928 anesthetics. Mary Imogene Bassett Hospital administered 2,001 anesthetics and directed the Inhalation Therapy Service. Harlem Hospital administered anesthesia to 4,475 patients and directed the Inhalation Therapy Service. The Pulmonary Function Laboratory shared responsibility for the Intensive Care Unit, which treated 480 patients.

Epstein, R. A. and Jackson, S. H.

The effect of depolarizing relaxants on the neuromuscular refractory period of anesthetized man. *Anesthesiology* 38:166, 1973.

Epstein, R. M.; Epstein, R. A. and Lee, A. S. J.

A recording system for continuous evoked electromyography. *Anesthesiology* 38:287, 1973.

Esser, R. E., Frick, H. C.; Greenwood, A. and Nahas, G. G.

Letter to the Editor: What marijuana can do to you. *N. Y. Times*, May 1973.

Finster, M.

Effects of obstetric anesthesia on the fetus and newborn. In: *Anaesthesia und Wiederbelebung bei Sauglingen und Kleinkindern*, F. Ahnefeld and M. Halmagyi, ed. Springer-Verlag, Berlin, 1973.

Transplacental passage of general anesthetics and hypnotics. In: *Bases Fondamentales de l'Anesthesie et de la Reanimation Obstetricales*, G. G. Nahas, J. C.

- Salamagne, P. Viars and G. Vourc'h, ed. Librairie Arnette, Paris, 1973.
- Finster, M.; Perel, J. M.; Hinsvark, O. N. and O'Brien, J. E.
Reassessment of the metabolism of 2-chloroprocaine hydrochloride (Nescaïne®). (Abstract) *Abstr. Sc. Papers, ASA Ann. Mtg.*, 1973, p. 29.
- Finster, M.; Poppers, P. J.; Horowitz, P. E. and Matteo, R. S.
Placental transfer of d-tubocurarine (Abstract) *Abstr. Sc. Papers, ASA Ann. Mtg.*, 1973, p. 43.
- Fukunaga, A. and Epstein, R. M.
Sympathetic excitation during nitrous oxide-halothane anesthesia in the cat. *Anesthesiology* 39:23, 1973.
- Horowitz, P. E. and Spector, S.
Determination of serum d-tubocurarine concentration by radioimmunoassay. *J. Pharmacol. & Exper. Therap.* 185:94, 1973.
- Hsu, J.; Ostrowski, D.; Polanyi, M. and Nahas, G. G.
Definition of an erythrocyte osmotic fragility index with a new fragilograph (Abstract). *Physiologist* 16:349, 1973.
- Hyman, A. I.
Physiology of the autonomic nervous system. In: *Bases Fondamentales de l'Anesthésie et de la Réanimation Obstétricales*. Librairie Arnette, Paris, 1973.
- James, L. S.
Respiratory distress syndrome pathogenesis. In: *Bases Fondamentales de l'Anesthésie et de la Réanimation Obstétricales*. Librairie Arnette, Paris, 1973.
- Katz, R. L.
Studies of new agents in the treatment of postoperative apnea (Abstract). *Proc. Fifth World Cong. Anesth.*, Kyoto, Japan, 1972.
- Katz, R. L.; Kao, C. K.; Spiegel, H. and Katz, G. J.
Pain, hypnosis and acupuncture (Abstract). *Proc. Int. Symp. on Pain*, Seattle, Washington, 1973.
- Katz, R. L. and Katz, G. J.
Factors altering the actions of neuromuscular blocking actions (Abstract). *Proc. Fifth World Cong. Anesth.*, Kyoto, Japan, 1972.
- Khambatta, H. J. and Sullivan, S. F.
Body carbon dioxide stores and passive hyperventilation alkalosis (Abstract). *Fed. Proc.* 32:341, 1973.
Effect of respiratory alkalosis on oxygen consumption and oxygenation. *Anesthesiology* 38:53, 1973.
- Koehler, J.; Triner, L. and Vulliamoz, Y.
Adenyl cyclase, phosphodiesterase, cyclic AMP system in thyrotoxic periodic paralysis, thyrotoxic myopathy, and sporadic hypokalemic periodic paralysis. *Neurology* 23:408, 1973.
- Levine, O. R.; Dell, R. B.; Bowe, E. and Hyman, A. I.
Pulmonary extravascular chloride space and albumin content in adult and immature adults (Abstract). *Fed. Proc.* 32:341, 1973.
- Mark, L. C.
Acupuncture and suggestion. (Letter to Editor.) *J.A.M.A.* 223:922, 1973.
Double blind studies of acupuncture. (Letter to Editor.) *J.A.M.A.* 225:1532, 1973.
- Mark, L. C.; Brand, L.; Heiber, S.; Smith D. and Carroll, F. I.
Pharmacologic activity and biotransformation of R+ and S- barbiturate enantiomers in mouse and man (Abstract). *Fed. Proc.* 32:681, 1973.
- Mark, L. C. and Kutscher, A. H.
Acupuncture: A thought for the future. In: *Psychopharmacologic Agents for the Terminally Ill and Bereaved*. I. K. Goldbert, S. Malitz, and A. H. Kutscher, ed. Columbia University Press, New York, 1973.
- Mark, L. C. and Poppers, P. J.
Transplacental passage of muscle relaxant drugs. In: *Bases Fondamentales de l'Anesthésie et de la Réanimation Obstétricales*. Librairie Arnette, Paris, 1973.
- Matteo, R. S. and Horowitz, P. E.
Relation of serum d-tubocurarine concentration to neuromuscular blockade in man (Abstract). *Abstr. Sc. Papers, ASA Ann. Mtg.*, 1973, p. 75.
- Morishima, H. O.; Cohen, H.; Brown, W. U.; Daniel S. S.; Niemann, W. Y. and James, L. S.
The inhibitory action of diazoxide on uterine activity in the subhuman primate: Placental transfer and effect on the fetus. *J. Perinat. Med.* 1:13, 1973.
- Morishima, H. O.; Glaser, B.; Niemann, W. H.; Daniel S. S. and James, L. S.
Increased uterine activity and fetal deterioration during experimental hyperthermia. *Proc. 43rd Ann. Mtg. Soc. Ped. Res.*, May 1973.
- Nagel, M. D. and Nahas, G. G.
Induction de la transformation lymphoblastique chez la Souris par le delta-9-tetrahydrocannabinol. *C. R. Acad. Sc.*, Paris 276 (Serie D): 1089, 1973.
- Nahas, G. G.
Actions uterines des substances agissant sur l'utero par l'intermédiaire du système nerveux autonome. In *Bases Fondamentales de l'Anesthésie et de la Réanimation Obstétricales*. Librairie Arnette, Paris, 1973.
Cannabis and academia. *P & S Quart.* 18:15, 1973.
Clinical pharmacology of Cannabis sativa with special reference to delta-9-THC. *Bull. Narcotics* 25:9, 1973.
- Nahas, G. G. and Greenwood, A.
A critique of the first report of the national commission on marijuana and drug abuse (1972). *Psychiat. Ann.* 3:94, 1973.
- Nahas, G. G.; Salamagne, J. C.; Viars, P. and Vourc'h, G. Editors, *Bases Fondamentales de l'Anesthésie et de la Réanimation Obstétricales*. Librairie Arnette, Paris 1973.
- Nahas, G. G.; Salamagne, J. C.; Viars, P.; Vourc'h, G. and Sureau, C.
Anesthésie-Analgésie et Réanimation en Milieu Obstétrical. Librairie Arnette, Paris, 1973.

- Nahas, G. G.; Schwartz, I. W. and Adamec, J.
Immunosuppression and tolerance development to delta-9-tetrahydrocannabinol (Abstract). *Fed Proc.* 32:756, 1973.
- Nahas, G. G.; Schwartz, I.; Adamec, J. and Manger, W. M.
Tolerance to delta-9-tetrahydrocannabinol in the spontaneously hypertensive rat. *Proc. Soc. Exper. Biol. & Med.* 142:58, 1973.
- Nahas, G. G.; Schwartz, I.; Palacek, J. and Zagury, D.
Effet d'un inhibiteur de la response immunogene sur le developpement de la tolerance au delta 9 tetrahydrocannabinol. *C. R. Acad. Sc.* 276:667, 1973.
- Nahas, G. G.; Suci-Foca, N. and Armand, J. P.
Diminution de l'immunité cellulaire chez le fumeurs de chanvre. *C. R. Acad. Sc.* 276 (Serie D), 1973.
- Nahas, G. G. and Vourc'h, G.
Toxicité du chanvre indien. *La Nouvelle Presse Médicale* 2:167, 1973.
- Nahas, G. G.; Zagury, D.; Schwartz, I.;
Nagel, M. and Daniele, M.
Evidence for the possible immunogenicity of Δ^9 -tetrahydrocannabinol (THC) in rodents. *Nature* 243:407, 1973.
- Nastuck, W. L.; Gissen, A. J. and Karis, J. H.
Some factors involved in the use of certain pharmacological agents in the treatment of myasthenia gravis. In: *Endocrines and Enzymes in Anesthesiology*. C. M. Ballinger and V. L. Brechner, ed. Charles C Thomas, Springfield, 1973.
- Papper, E. M.; Ngai, S. H. and Mark, C. C.
Anesthesiology—Progress since 1940. University of Miami Press, Coral Gables, Fla., 1973.
- Pantuck, E. J.; Kuntzman, R. and Conney, A. H.
Decreased concentration of phenacetin in plasma of cigarette smokers (Abstract). *Dokumentation Sozialmedizin öffentlicher Gesundheitsdienst Arbeitmedizin* 5:491, 1973.
- Patterson, R. W. and Sullivan, S. F.
The interrelationship between lung compliance and airway carbon dioxide concentration during hemorrhagic shock. *J. Trauma* 13:238, 1973.
- Peters, H. and Nahas, G. G.
Editors, *Hashish and Mental Illness*. J. J. Moreau, Raven Press, New York, 1973.
- Poppers, P. J.
Controlled evaluation of ultrasonic measurement of systolic and diastolic blood pressures in pediatric patients. *Anesthesiology* 38:187, 1973.
- First clinical trial of Duranest®. *Anesth. Analg.* 52:412, 1973.
- New monitoring methods and instruments. *Abstracts of Lectures*, ASS Ann. Mtg. 1973, p. 227.
- Poppers, P. J.; Finster, M.; Topaz, S. R. and Hatke, F. J.
A monitoring system incorporating ultrasonic fetal cardiotachometry and uterine electromyography. *Anesthesiology* 38:88, 1973.
- Poppers, P. J.; Hochberg, H. M. and Schmalzbach, E. L.
A method for ultrasonic measurement of blood pressure in the adult leg. *Anesthesiology* 38:490, 1973.
- Sprague, D. H.; Yang, J. C. and Ngai, S. H.
The effect of isoflurane (Forane) and halothane on the contractility and the cyclic 3',5'-adenosine monophosphate (cAMP) system in rat aorta (Abstract). *Abstr. Sc. Papers*, ASA Ann. Mtg., 1973, p. 17.
- Stanley, T. H. and Zikria, B. A.
The effects of fat-soluble anesthetic agents on tracheal-bronchial secretion surfact tensions. *Surgery* 73:386, 1973.
- The effects of general anaesthesia on the surface tensions of secretions in the upper airway in patients with and without pulmonary disease. *Can. Anaesth. Soc. J.* 20:290, 1973.
- Vulliemoz, Y.; Verosky, M.; Finster, M. and Triner, L.
The effect of PGE₁ and catecholamines on the cAMP system in rat and human uterine smooth muscle (Abstract). *Pharmacologist* 15:230, 1973.
- Vulliemoz, Y.; Verosky, M.; Katz, R.; and Triner, L.
Effect of some synthetic beta adrenergic agonists on the cyclic AMP system in smooth muscle (Abstract). *Fed. Proc.* 32:712, 1973.
- Wang, H. H.; Liu, L. and Katz, R. L.
A comparison of the cardiovascular effects of sodium nitroprusside and trimetaphan. *Abstr. Sc. Papers*, ASA Ann. Mtg., 1973, p. 223.
- Welch, R. M.; Jones, E.; Pantuck, E. J. and Gillespie, D. D.
Effect of cigarette smoking on the metabolism of phenacetin in man (Abstract). *Pharmacologist* 15:212, 1973.
- Wilson, R. S.; Sullivan, S. F.; Malm, J. R. and Bowman, F. O., Jr.
The oxygen cost of breathing following anesthesia and cardiac surgery. *Anesthesiology* 39:387, 1973.
- Yang, J. C.; Triner, L.; Vulliemoz, Y.; Verosky, M. and Ngai, S. H.
Effects of halothane on the cyclic 3',5'-adenosine monophosphate (cyclic AMP) system in rat uterine muscle. *Anesthesiology* 38:244, 1973.
- Yeh, M.; Morishima, H. O. and James, L. S.
Myocardial conduction defects and fetal bradycardia (Abstract). *Proc. 43rd Ann. Mtg., Soc. Ped. Res.*, 1973.

Biochemistry

ERWIN CHARGAFF

Professor and Chairman of the Department

We regret to report the death of Professor Samuel Graff on September 25, 1973. Dr. Graff had been designated Professor Emeritus in the summer of this year; Mrs. Ada Graff retired as Associate.

This year 27 graduate students were in residence, and the Ph.D. degree was awarded to four students. Dr. Allen Gold is on sabbatical leave at present, and Dr. Max Eisenberg has been appointed Acting Graduate Student Advisor. Professor Parithychery Srinivasan succeeded Professor Philip Feigelson as Medical Course Director. The elective series of lectures is being continued; it offers joint presentations by biochemists and clinicians to both medical and dental students.

In conjunction with the Department's weekly seminar program Dr. Walter Gilbert of Harvard University was invited to present a special series of lectures entitled "Regulatory Mechanisms in Transcription."

Dr. Erwin Chargaff received the Gregor Mendel Medal from the German Academy of Science Leopoldina, whose meeting he attended in Halle. He also was invited to give lectures at the Universities of Vienna and Heidelberg and at the Max Planck Institute in Munich. In addition, he delivered several lectures and seminars at various universities in this country. Drs. Ruth and Reinhold Benesch participated in and read a paper at a meeting on Structure and Function of Hemoglobin at the Royal Society in London in February; they also gave several lectures in this country. Dr. Seymour Lieberman was elected President-Elect of the Endocrine Society.

Dr. Barbara W. Low has been appointed a member of the Research Council of the Public Health Research Institute of the City of New York.

Research

The work on chemical modification at specific sites on the hemoglobin molecule with consequent modifications in the functional properties of the protein was continued in the laboratory of Drs. Ruth and Reinhold Benesch. Miss Suzanna Yung, Dr. Tomokazu Suzuki from Osaka University Medical School, Japan, and Dr. Christian Bauer from the Medical School in Hanover, Germany, participated in this work. These results are now being applied to sickle hemoglobin as a probe for the abnormal molecular transformations in this inherited hematologic disorder. Recently Dr. Grace Hsieh joined the group. She is engaged in the synthesis of novel pyridoxal derivatives. A collaboration was also begun with Professor Arthur Arnone of the University of Iowa. The Benesch's have also contributed invited reviews to *Advances in Protein Chemistry*, to the second edition of *The Red Blood Cell*, and to *Molecular and Cellular Biochemistry*.

Dr. Erwin Chargaff and his colleagues studied the mechanisms of the biosynthesis of DNA and related problems as well as the role of phosphotransferases in the synthesis of nucleotides. With Dr. Elinor F. Brunngraber, aspects of the low-energy synthesis of nucleotides and also of NADP were investigated. Dr. John D. Karkas participated in study of the mechanism of action of various DNA

polymerases with special emphasis on template requirements; his independent work is mentioned elsewhere. Study of a novel polyribonucleotide synthetase, begun with Dr. Roberto Milanino, is being continued by Dr. Jannis G. Stavrianopoulos, who also completed an investigation of highly purified ribonuclease H. Dr. Lola Margulies studied the nucleic acid polymerases arising during the development of *Drosophila*.

Dr. Max Eisenberg is continuing his studies on biotin biosynthesis control and transport. Mr. Gerald Stoner has completed his kinetics studies on the aminotransferase enzyme. Dr. Om Prakash has joined the group and is currently studying the active transport of biotin in *Escherichia coli*. Investigation of the control of biotin biosynthesis has been started in an *in vitro* system.

The laboratory of Dr. Philip Feigelson has continued to study the role of enzymic heme and copper in the allosteric control and catalytic activity oxygenase. Hepatic and microbial tryptophan oxygenases have been purified to homogeneity. In both instances, the enzymes are tetrameric and contain two heme and two copper moieties per tetramer. Hepatic tryptophan oxygenase catalyzes the first committed step in the reaction pathway by which tryptophan is converted to the coenzyme, NAD. It is a regulatory enzyme whose catalytic efficiency is subject to feedback inhibition by an intermediate of this pathway, 3-hydroxyanthranilate, which acts as a negative modulator.

Dr. Allen M. Gold continued to study the mechanism of action of the enzyme polysaccharide phosphorylase, which plays a key role in the regulation of carbohydrate metabolism. The structural requirements of the polysaccharide substrate were studied with Mrs. Hsiang-Yun Hu. The mechanism of calcium ion transport in the sarcoplasmic reticulum of mammalian skeletal muscle was investigated with Mr. Michael Osber and Miss Eva Legrand. The mechanism of this ATP-dependent transport system is being elucidated by studying the inhibition produced by reaction products and certain drugs. Dr. Gold spent the latter half of the year on sabbatical leave, visiting the laboratory of Dr. S. J. Singer at the University of California, San Diego. There, he began an investigation of the structure of the sarcoplasmic reticulum membrane by immunological and physical methods recently developed in that laboratory.

The laboratory of Dr. Dezider Grunberger continues to study the mechanism of action of chemical carcinogens and has established, with Dr. Phillip Feigelson, that the potent carcinogen N-hydroxy-2-

acetyl-aminofluorene significantly inhibits the synthesis of rat hepatic nuclear RNA. With Dr. I. B. Weinstein (Medicine), Dr. Grunberger studied the antitumor effect of 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea, which is used in the treatment of certain neoplasms of the central nervous system. In studies of liver phenylalanine-tRNA and phenylalanyl-tRNA synthetase the fluorescent base from calf and beef liver tRNAs has been isolated. Also, the synthetase enzyme from rat liver has been purified.

Dr. Ronald L. Hanson has been investigating the energy-linked transhydrogenase in *Esch. coli*. The stimulation of the rate of the membrane-bound transhydrogenase by ATP is mediated by the membrane-bound ATPase and the stimulation is abolished by inhibitors and uncouplers of oxidative phosphorylation. The mechanism of energy coupling between these two enzymes is being studied in order to gain general information on energy transductions by membrane enzymes. The transhydrogenase was purified this year by Hanson, and a study of the kinetic mechanism is under way. The mechanism of repression of the transhydrogenase by leucine is being examined by Barbara Gerolimatos. She is studying requirements for derepression of this enzyme following removal of leucine, to provide information on membrane assembly processes.

Dr. John D. Karkas continued work on the enzymes of nucleic acid metabolism. He studied the conditions for reverse transcription by DNA polymerase I and developed a new method for determination of DNA ligase. He also started work on a survey of the nucleases of the developing chicken embryo.

Dr. Alvin I. Krasna continued to study changes in the biological and physical properties of DNA and transfer RNA after modification of the base residues by chemical methylation or ethylation. Studies were also carried out on the effects of enzymatic methylation. The enzyme hydrogenase from *Chromatium* was purified to homogeneity and its mechanism of action investigated. Peter Gitlitz, Jerrold Greenberg, and Eric Holwitt collaborated in these studies.

The laboratory under the direction of Dr. Seymour Lieberman continues its studies of the biochemistry and metabolism of the steroid hormones. The following participated in this work: Drs. Richard Hochberg, Patrick McDonald, Paula Zimmering, Laura Ponticorvo, Fred Chasalow, Wylie Hembree, Richard Ehrenkauf, Violet Lippman, and Shoshana Ladany. Two graduate students under the direction of Dr. Lieberman are continuing their

studies. Mr. Frank Gasparini is attempting to confirm the report that human breast cancer tissue can convert cholesterol into pregnenolone and androstenedione into estrogens. Miss Marie Monaco is attempting to determine the steroidal precursors of estrogens formed by rat testes.

Dr. Barbara W. Low and her associates, Dr. Hugh S. Preston, Dr. Lawrence S. Rosen, Dr. Andrew D. Rudko, Mr. James E. Searl, and Mr. Atsushi Sato, are working on determination of the structure of erabutoxin b and related neurotoxins. These are snake venom proteins, which inhibit the (membrane) receptor protein in the cholinergic system. This work continues in collaboration with Professor Nobuo Tamiya, Toboku University, Japan, and has been extended to studies of laticotoxin from *Laticauda laticaudata*. Collaborative work with Professor Dean D. Watt, Creighton University, Omaha, Nebraska, on the scorpion venom toxin from *C. sculpturatus* has also begun.

With Drs. Rosen and Rudko, the structures of two peptide hormones are under study. Studies continue on the phenomena of aggregating interactions between one protein and other "initiating" proteins and peptides, which lead to the separation of new ordered or quasi-ordered assays of the principal protein with some incorporation of "initiator."

The conformation of an azo-benzene sulfonic acid of specific use in the preparation of crystalline peptides is under study with Mr. Godfrey A. Crane. Work continues with Mr. Crane on the correlation of conformation with amino-acid sequence, as in proteins.

Richard W. Moyer has concentrated his efforts on developing an experimental system to study the expression of plasmids. Plasmids are a broad class of parasitic extrachromosomal genetic elements which can markedly modify physiological properties of host cells. Membrane alterations and resistance to viral attack are among the properties which can be imparted to host cells by plasmids. Work to date has shown that plasmid specific protein synthesis occurs at a high level only when plasmids are newly introduced into a host cell and for only a very short period of time.

Ronald C. Herman has perfected the use of agarose gels as a technique to analyze the structure of viral DNA present in crude extracts of infected cells. The technique has been utilized to determine the role of "nicks" or interruptions found in parental DNA molecules present in certain viruses. His studies have shown that the interruptions in the DNA are repaired prior to replication of the molecule. Furthermore, it is clear from such studies that the

presence or absence of the interruptions in DNA can play an important role in the selective expression of different viral genes.

Charles Szabo has continued to study the mechanism of bacteriophage T5 restriction by the colicin factor Col, an extrachromosomal genetic element found in certain strains of bacteria. The ColIb factor prevents T5 growth by blocking the synthesis of some of the essential viral messenger RNA species. His studies have focused on determination of the number and role of viral specific proteins involved in the process of regulation of viral transcription.

Dr. Lawrence Skogerson, with Karen Johnson, Usha Somasundaran, and Eunice Wakatama, has continued efforts to isolate and characterize mutants of yeast with altered elements of the translation apparatus. A major effort has been made to purify ribosomes and associated factors in order to be able to identify the altered element in potential mutants. Dr. Skogerson has concentrated on separation and purification of the elongation factors, while Ms. Somasundaran has been concerned with initiation factors. Ms. Johnson has succeeded in showing that cryptopleurine-resistant mutants have an altered small ribosomal subunit and is attempting to elucidate the mechanism of inhibition of the inhibitor. Further genetic analysis of yeast mutants was carried out by Ms. Wakatama.

Dr. David B. Sprinson and his collaborators have continued investigations on the regulation of ergosterol biosynthesis in yeast and have obtained mutants requiring ergosterol or cholesterol for growth. Nystatin-resistant mutants of yeast were also studied. Work is proceeding on the purification and properties of the allosteric 3-deoxy-D-arabino-heptulosonate 7-phosphate synthetase of bacteria, as well as of 5-dehydroquinate synthetase. Participating in this work have been Drs. Mella Adlersberg, Jean Dayan, Edith Gollub, Paul Trocha, Utpalendu S. Maitra, and Stanley Jasne, and Mr. Roger Hu.

Dr. Parithy Cheryl R. Srinivasan and his associates have continued their investigations on the regulation of RNA synthesis, the biological function of methylated bases in nucleic acids, and the role of polyamines in bacterial cell division and growth. Recently Dr. Srinivasan described isolation and partial purification of a protein from T3 phage-infected cells which may be responsible for the regulation of host RNA synthesis in T3-infected *Esch. coli* cells. This protein requires the presence of sigma factor subunit to elicit inhibition of RNA polymerase with various DNA templates. This protein does not bind directly to DNA or RNA polymerase or RNA polymerase-DNA complex but requires the presence

of the initiation nucleotides (i.e., ATP and GTP) for binding to the enzyme-DNA complex. Apart from the production of this inhibitory protein in infected cells, T3 phage also modifies *part* of the host RNA polymerase. The specific activity of the modified RNA polymerase is markedly lower (i.e., $\frac{1}{4}$) than the specific activity of the normal enzyme. The decrease in activity is probably due to an alteration in the β' subunit of the polymerase. The investigations of polyamines by this group suggest that these organic cations do not play a direct role in stable RNA synthesis but rather alleviate certain conditions that inhibit RNA synthesis.

1973 Publications

Biochemistry

Adlersberg, M.; Bondinell, W. E. and Sprinson, D. B.
Synthesis of 2-hydroxyquinic and 2-hydroxyepiquinic acids from shikimic acid. *J. Am. Chem. Soc.* **95**:887-896, 1973.

Beato, M.; Kalimi, M.; Konstam, M. and Feigelson, P.
Interaction of glucocorticoids with rat liver nuclei II. Studies on the nature of the cytosol transfer factor and the nuclear acceptor site. *Biochemistry* **12**:3372-3379, 1973.

Benesch, Ruth, E.; Benesch, Reinhold and Yung, Suzanna
Equations for the spectrophotometric analysis of hemoglobin mixtures, *Anal. Biochem.* **55**:245-249, 1973.

Benesch, Ruth E.; Benesch, Reinhold; Yung, Suzanna; Baer, Erich and Robinson, Ranga
A comparison of diphosphonoglyceric acid and diphosphoglyceric acid as allosteric effectors for hemoglobin. *Canad. J. Biochem.* **51**:1120-1122, 1973.

Benesch, Ruth E.; Yung, Suzanna; Suzuki, Tomokazu; Bauer, Christian and Benesch, Reinhold
Pyridoxal compounds as specific reagents for the α and β N-termini of hemoglobin. *Proc. Nat. Acad. Sc. (USA)* **70**:2595-2599, 1973.

Blobstein, Steven; Grunberger, Dezider; Weinstein, I. Bernard and Nakanishi, Koji
Isolation and structure determination of the fluorescent base from bovine liver phenylalanine transfer ribonucleic acid. *Biochemistry* **12**:188-192, 1973.

Brady, F. O. and Feigelson, P.
Photoactivation of pseudomonad L-tryptophan oxygenase by electron ejection from its substrate, L-tryptophan. *Arch. Biochem. Biophys.* **156**:745-750, 1973.

Brady, F. O.; Feigelson, P. and Rajagopalan, K. V.
Studies of the copper and heme cofactors of pseudomonad L-tryptophan-2, 3-dioxygenase by electron paramagnet resonance spectroscopy. *Arch. Biochem. Biophys.* **157**:63-72, 1973.

Acknowledgment

The activities of the Department received support during the year through grants from the American Cancer Society, the American Heart Association, the Atomic Energy Commission, the Health Research Council of the City of New York, the National Institutes of Health, the National Science Foundation, the Rockefeller Foundation, Smith, Kline and French Laboratories, the Irma T. Hirsch Trust Fund, and the Muscular Dystrophy Association.

Brunngraber, Elinor F. and Chargaff, Erwin
A nucleotide phosphotransferase from *Escherichia coli*: Purification and properties. *Biochemistry* **12**:3005-3012, 1973.

Nicotinamide-adenine dinucleotide as substrate of the nucleotide phosphotransferase from *Escherichia coli*. *Biochemistry* **12**:3012-3022, 1973.

Chargaff, Erwin
Bitter fruits from the tree of knowledge: Remarks on the current revulsion from science. *Perspect. Biol. & Med.* **16**:486-502, 1973.

DeLeo, A. B.; Dayan, J. and Sprinson, D. B.
Purification and kinetics of tyrosine-sensitive 3-deoxy-D-arabino-heptulosonic acid 7-phosphate synthetase from *Salmonella*. *J. Biol. Chem.* **248**:2344-2353, 1973.

Dharmgrongartama, B.; Mahadik, S. P. and Srinivasan, P. R.
Modification of RNA polymerase after T3 phage infection of *Escherichia coli* B. *Proc. Nat. Acad. Sc. (USA)* **70**:2845-2849, 1973.

Eisenberg, Max A.
Biotin—Biogenesis, transport and their regulation. *Advances Enzymol.* **38**:317-350, 1973.

Feigelson, P.; Brady, F. O. and McCray, J. A.
Allosteric modulation of the transient kinetics of carboxy tryptophan oxygenase complex formation after laser flash photolysis. *J. Biol. Chem.* **248**:5267-5271, 1973.

Gold, Allen M. and Osber, Michael P.
On the mechanism of glycogen phosphorylase. *Arch. Biochem. Biophys.* **153**:784-787, 1972.

Gollub, E. G.; Liu, K. P. and Sprinson, D. B.
A regulatory gene of phenylalanine biosynthesis (pheR) in *Salmonella typhimurium*. *J. Bacteriol.* **115**:121-128, 1973.

tyrR, A regulatory gene of tyrosine biosynthesis in *Salmonella typhimurium*. *J. Bacteriol.* **115**:1094-1102, 1973.

- Grunberger, George; Yu, F. L.; Grunberger, D. and Feigelson, P.
Mechanism of N-hydroxy-2-acetylaminofluorene inhibition of rat hepatic ribonucleic acid synthesis. *J. Biol. Chem.* **248**:6278-6281, 1973.
- Hembree, W. C.; Ehrenkaufer, R. E.; Lieberman, S. and Wolf, A. P.
A general method of tritium labeling utilizing microwave discharge activation of tritium gas. Methodology and application to biologic compounds. *J. Biol. Chem.* **248**:5532-5540, 1973.
- Hochberg, R. B.; Ladany, S. and Lieberman, S.
Cholesterol sulfate: Some aspects of its biosynthesis and uptake by tissues from blood. *Endocrinology* **93**: 1125-1129, 1973.
- Hochberg, R. B.; McDonald, P. D.; Feldman, M. and Lieberman, S.
Studies on the biosynthetic conversion of cholesterol into pregnenolone: III. Sidechain cleavage of some 20-para-tolyl analogs of cholesterol and 20 α -hydroxy. *J. Biol. Chem.* **248**:8218-8226, 1973.
- Johnson, Richard and Krasna, Alvin I.
¹⁸O studies on the oxidative and nonoxidative pentose phosphate pathways in wild-type and mutant *E. coli* cells. *Biochemistry* **12**:1969-1977, 1973.
- Kalimi, M.; Beato, M. and Feigelson, P.
Interaction of glucocorticoids with rat liver nuclei. I. Role of the cytosol proteins. *Biochemistry* **12**:3365-3371, 1973.
- Margulies, Lola and Chargaff, Erwin
Survey of DNA polymerase activity during the early development of *Drosophila melanogaster*. *Proc. Nat. Acad. Sc. (USA)* **70**:2946-2950, 1973.
- Milanino, Roberto and Chargaff, Erwin
A purine polyribonucleotide synthetase from *Escherichia coli*. *Proc. Nat. Acad. Sc. (USA)* **70**:2558-2562, 1973.
- Modak, Mukund J. and Srinivasan, P. R.
Purification and properties of a ribonucleic acid primer-independent polyriboadenylate polymerase from *Escherichia coli*. *J. Biol. Chem.* **248**:6904-6910, 1973.
- Rabbani, Elazar and Srinivasan, P. R.
Role of the translocation factor G in the regulation of ribonucleic acid synthesis. *J. Bacteriol.* **113**:1177-1183, 1973.
- Schmall, Bernard; Cheng, C. J.; Fujimura, S.; Gersten, N.; Grunberger, D. and Weinstein, I. B.
Modification of proteins by 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosoarea (NSC 79037) *in Vitro*. *Cancer Res.* **33**:1921-1924, 1973.
- Schutz, G.; Beato, M. and Feigelson, P.
Messenger RNA for hepatic tryptophan oxygenase: Its partial purification, its translation in an heterologous cell free system and its control by glucocorticoid hormones. *Proc. Nat. Acad. Sc. (USA)* **70**:1218-1221, 1973.
- Searl, James E.; Fullerton, W. Wardle and Low, Barbara W.
X-ray crystallographic study of laticotoxin a. *J. Biol. Chem.* **248**:6057-6058, 1973.
- Skogerson, L.; McLaughlin, C. and Wakatama, E.
Modification of ribosomes in cryptopleurine resistant mutants of yeast. *J. Bacteriol.* **116**:818-822, 1973.
- Srinivasan, P. R.
Biosynthesis of anthranilic and p-aminobenzoic acids. In: *Enzymes of Glutamine Metabolism*. Academic Press, Inc., New York, 1973.
- Srinivasan, P. R.; Young, Delano V. and Maas, Werner
Stable ribonucleic acid synthesis in stringent (*rel*⁺) and relaxed (*rel*⁻) polyamine auxotrophs of *Escherichia coli* K-12. *J. Bacteriol.* **116**:648-655, 1973.
- Stavrianopoulos, Jannis G. and Chargaff, Erwin
Purification and properties of ribonuclease H of calf thymus. *Proc. Nat. Acad. Sc. (USA)* **70**:1959-1965, 1973.
- Suzuki, Tomokazu; Benesch, Ruth E.; Yung, Suzanna and Benesch, Reinhold
Preparative isoelectric focusing of CO hemoglobins on poly-acrylamide gels and conversion to their oxy forms. *Anal. Biochem.* **55**:249-254, 1973.
- Tscherne, Joan S.; Lanks, K. W.; Salim, P. D.; Grunberger, D.; Cantor, C. R. and Weinstein, I. B.
Studies on rat liver phenylalanyl-tRNA synthetase. II Further purification, substrate specificity and effects of substrates on heat inactivation. *J. Biol. Chem.* **248**: 4052-4059, 1973.
- Van der Veen, James M. and Low, Barbara W.
The crystal structure of glycyl-L-phenylalanine p-toluenesulphonate and glycyl-L-phenylalanine p-bromobenzenesulphonate. *Acta Cryst.* **B28**:3548-3559, 1972.

Dermatology

LEONARD C. HARBER

Professor and Chairman of the Department • Director of Service

This year was characterized by transition to new administrative leadership in the Department and Dermatology Service. Dr. Saul Sanders served as Acting Chairman and Acting Director of the Dermatology Service from July 1 to September 1, 1973, when Dr. Leonard C. Harber was appointed Professor and Chairman of the Department and Director of the Dermatology Service. The departmental plans developed by his predecessor, Dr. Carl T. Nelson, who retired June 30, 1973 after 27 years of distinguished service, which stressed re-evaluation and reorganization of dermatologic academic and service activities came closer to implementation. Newer developments were particularly emphasized, both in research and in patient care delivery. Programs now in progress include renovating laboratory facilities, expanding the dermatologic inpatient service, and acquiring the most modern therapeutic instruments for delivery of dermatologic outpatient care. Reorganization of the clinic hours and personnel continued in order to permit more effective and efficient outpatient services.

Changes in Staff

Dr. Nelson retired as Chairman, a post which he had held since 1951. In addition to his clinical, administrative, and teaching activities, Dr. Nelson had investigated tissue electrolyte changes in anaphylaxis, pemphigus, sarcoidosis and the Kveim reaction, and inflammatory factors in psoriasis. He will continue his investigative work and private practice.

Dr. Harber was appointed Professor and Chairman of the Department and Director of the Dermatology Service. Dr. Harber came from New York University School of Medicine, where he had been Professor of Dermatology since 1968. He has also been Guest Investigator in the Metabolic Unit at the Rockefeller University from 1969 through the present.

Dr. Sanders, who so ably served as Acting Chairman and Director, relinquished this appointment September 1, 1973 and assumed his responsibilities as Chief of the Dermatology Clinic.

Dr. Alan Shalita was appointed Assistant Professor of Dermatology as of July 1, 1973. He formerly had been on the staff of the Department of Dermatology, New York University Medical Center, where he conducted lipid research in the Metabolic Laboratories of Dr. N. Spritz at the Manhattan V. A. Hospital and was Assistant Director of the Dermatology Service at Bellevue Hospital Center.

Dr. David R. Bickers joined the Department on September 1, 1973. He too had been a member of the New York University Department of Dermatology, as well as Assistant Professor at the Rockefeller University (Section of Endocrine Metabolism).

Dr. Maureen Poh was appointed Assistant Professor in Dermatology on November 1, 1973. She had trained in the Department of Dermatology of Washington University in St. Louis.

Dr. Angelo Lamola, still actively a member of the Bell Telephone Laboratory, joined the Photobiology Unit of the Department as both lecturer and research investigator.

Dr. Harvey Weinberg was appointed Assistant after completing his training in Dermatology at the U.S. Public Health Service Hospital.

Dr. Mark Lichtenberg was appointed Assistant and will do research in photobiology.

Dr. Paul Gross, who retired this year, is now devoting his time exclusively to private practice outside the Medical Center.

Dr. K. William Waterson, Jr. resigned to enter private practice in West Virginia.

Dr. Loren Golitz Assistant Dermatologist in Vanderbilt Clinic, who was affiliated with the U.S. Public Health Service, also resigned on June 30, 1973.

Dr. Marvin Brodey was granted a leave of absence.

Staff Honors and Activities

Dr. Harber was appointed to the Committee on Phototherapy of the Newborn, National Research Council Division of the National Academy of Sciences. He will serve on the Board of Directors of the Society of Investigative Dermatology and was selected to be Chairman of the Photobiology Section of the American Academy of Dermatology. He was also asked to head the Photobiology Section of the National Program for Dermatology as well as to continue on its Research Subcouncil.

Dr. Nelson was appointed Trustee of the New York Academy of Medicine.

Dr. Shalita was appointed Deputy Director, Subcouncil on Finance of the National Program for Dermatology, as well as Secretary of the National Acne Association. He was also appointed Membership Chairman of the Dermatologic Society of Greater New York and is a member of the Board of Directors of the American Society for Dermatologic Surgery.

Dr. Lewis Shapiro was a panelist and guest lecturer at the International Academy of Pathology Meeting in Washington, D. C. He was also a guest pathologist at the Zola Cooper Seminar at San Antonio, Texas.

Dr. Margarita Silva-Hutner was appointed a member of the Statutes Committee in the Mycology Section of the International Association of Microbiological Societies. She was also appointed one of an eight-member Committee on International Activities of the American Society for Microbiology. Dr. Silva-Hutner also continued to serve as a technical advisor representing the area of Medical Mycology for the American Type Culture Collection.

Dr. James P. Fields continued as Director of the Dermatology Residency Program at the U.S. Public Health Service Hospital, Staten Island, N.Y. He was guest lecturer at the Annual Scientific Meeting of the

Quain and Ramstad Clinic, Bismarck, North Dakota. Dr. Fields was appointed Leprosy Research Histopathologist for the Ridley immunological classification of U.S. leprosy cases used in scientific investigations.

Dr. Henry Hines continued as Administrative Director of Ambulatory Care Services, Harlem Hospital Center.

Dr. Anthony Domonkos was guest lecturer on radiation therapy for carcinoma of the skin at the American Academy of Dermatology.

Teaching

The Department continued to take an active role in the teaching program at the Medical School. Small group instruction was conducted at both Presbyterian and St. Luke's Hospitals during the clinical year. Students not only from P&S but also from other medical schools participated in elective programs at both institutions.

The graduate training program offered a combination of clinical and didactic training to four residents and a clinical fellow at Presbyterian Hospital, two residents from St. Luke's Hospital, and two from the U.S. Public Health Service Hospital. The Department also expanded its teaching activities to Roosevelt Hospital, where Dr. David Sibulkin took an active part in teaching residents and medical students.

Research

Dr. Harber continued his active research program on photosensitivity diseases and their relationship to other environmental factors.

Dr. Shalita has been actively investigating the role of lipids in the development of antibiotic resistance by *Pseudomonas aeruginosa*. In addition, the effects of various systemic and topical antibacterial agents on sebum composition and acne vulgaris are under investigation.

Dr. David Bickers has been working in the general area of porphyrin-heme biosynthesis. He has been particularly interested in the mechanisms involved in the pathogenesis of the genetic disease acute intermittent porphyria. In addition, his studies are currently attempting to define more precisely the biochemical abnormality in porphyria cutanea tarda.

Dr. Maureen Poh has been concentrating her research efforts this year on development of a simplified laboratory test for diagnosis of erythropoietic protoporphyria.

Drs. Frederick Rosenberg, Sanders, and Nelson completed a 20-year evaluation of 107 patients with pemphigus. Dr. Jack Eisert and Dr. Sanders, with Drs. Lowell Greenbaum (Pharmacology) and Toru

Niianaka (Pharmacology) initiated a study of chemotactic activity and inflammation in psoriasis.

Dr. Helen Curth studied the effect of the topical photosensitizer psoralen as a therapeutic agent in vitiligo.

Dr. Alex Young initiated a study of prostaglandin stimulation of cyclic AMP formation in psoriatic skin. In addition, Drs. Young and Eugene Sweeney at St. Luke's Hospital evaluated skin manifestations in heroin addicts and alcoholics.

Dr. Kenneth O. Lloyd continued studies on the immunochemistry of fungal carbohydrate antigens, working with both Drs. Wei-Li Lee and L. R. Travassos. He initiated study of surface antigens of epidermal cells in relationship to pemphigus with Mr. T. V. Darnule.

Mrs. Julia Einbinder continued to evaluate the significance of bound or circulating antibodies in patients with bullous disease, as well as, with Dr. Jeffrey Kroll, the immunologic profile of patients with chronic *Candida* infection.

Dr. William Merz continued his studies with the human pathological fungi of *T. rubrum*, *Aspergillus fumigatus*, and *Histoplasma capsulatum*.

Dr. Silva-Hutner continued studies with *Sporothrix schenckii*, a fungus known to be the cause of an endemic focus of human sporotrichosis in the

vicinity of New York City.

Dr. James P. Fields initiated studies on both the immunologic aspects of leprosy and its treatment with new synthetic chemotherapeutic agents.

Patient Care

During 1973, there were 20,892 out-patient visits to Dermatology in Vanderbilt Clinic. There were 119 admissions to the Dermatologic ward and 355 additional inpatients were seen in consultation with other services. The Mycology Laboratory examined 5,039 specimens and the Serological Research Laboratory performed 14,386 specific treponemal tests for patients admitted to the Medical Center.

The Department continued to meet regularly with the administration of Vanderbilt Clinic in an effort to improve delivery of medical care.

Acknowledgments

The Department acknowledges with gratitude the financial support given both clinical and laboratory research programs by the Brown-Hazen Fund of the Research Corporation, the Robert Sterling Clark Foundation, Duke Laboratories Foundation, the Arthur Ross Foundation, the estate of Ethel Weil, the Public Health Service and the various components of the National Institutes of Health.

1973 Publications

Dermatology

- Alvares, A. P.; Bickers, D. R. and Kappas, A.
Polychlorinated biphenyls: A new type of inducer of cytochrome P-448 in the liver. *Proc. Nat. Acad. Sc.* **70**: 1321-1325, 1973.
- Berger, C. L.; Merz, W. G. and Silva-Hutner, M.
Differences in the growth of *Aspergillus fumigatus* on cycloheximide media at three temperatures. *Antimicrob. Ag. Chemotherap.* **4**:388-391, 1973.
- Bickers, D. R. and Harber, L. C.
Diagnosis and treatment of selected photodermatoses. *Postgrad. Med.* **52**:65-71, 1972.
- Bickers, D. R.; Harber, L. C.; Kappas, A. and Alvares, A. P.
Polychlorinated biphenyls: Comparative effects of high and low chlorine containing aroclors on hepatic mixed function oxidase. *Res. Commun. Chem. Path. & Pharm.* **3**:305-512, 1972.
- Bradlow, H. L.; Zumoff, B.; Fukushima, D. K.; Sellman, L.; Bickers, D. R.; Alvares, A. P. and Kappas, A.
Drug-induced alterations of steroid hormone metabolism in man. *Ann. New York Acad. Sc.* **212**:148-155, 1973.
- Brownstein, M. H.; Fernando, S. and Shapiro, L.
Clear cell acanthoma: Clinicopathologic analysis of 37 new cases. *Am. J. Clin. Path.* **59**:306, 1973.
- Brownstein, M. H. and Shapiro, L.
Trichilemmoma: Analysis of 40 new cases. *Arch. Dermat.* **107**:866, 1973.
- Brownstein, M. H.; Shapiro, L. and Skolnik, P.
Kaposi's sarcoma in community practice (letter). *Arch. Dermat.* **107**:137, 1973.
- Curth, Helen O.
Acanthosis nigricans, incontinentia pigmenti, and the Naegeli syndrome. In: *Birth Defects (Atlas and Compendium)*. Daniel Bergsma, ed. Williams & Wilkins, Baltimore, 1973.
- Curth, Helen O.; I. Anton-Lamprecht and U. W. Schnyder
Zur Ultrastruktur hereditärer Verhornungsstörungen II. Ichthyosis hystrix typ Curth-Macklin. *Arch. Derm. Forsch.* **246**:77, 1973.
- Durst, Robert D., Jr.; Sibulkin, David; Trunnel, Thomas and Allyn, Burton.
Dose-related sero-reversal in syphilis. *Arch. Dermat.* **108**: November 1973.

- Dwyer, J. M.; Bullock, W. E. and Fields, J. P.
Disturbances of the blood T:B lymphocyte ratio in lepromatous leprosy. *New England J. Med.* 288:1036-1039, 1973.
- Golitz, Loren and Einbinder, Julia M.
The use of immunofluorescence microscopy in diagnosis of bullous skin diseases. *Proc. Joint Meeting of the Profession.* A. USPHS, May 9-12, 1973, p. 5.
- Golitz, L. E.; Shapiro, L.; Hurwitz, E. and Stritzler, R.
Cicatricial alopecia of sarcoidosis. *Arch. Dermat.* 107:758, 1973.
- Harber, Leonard C.
Contact photodermatitis. Chapter 12. In: *Contact Dermatitis*, 2nd ed. Alexander A. Fisher, ed. Lea & Febiger, Philadelphia, 1973, p. 197.
- Harber, L. C.; Baer, R. L. and Bickers, D. R.
Fundamental and cellular aspects of cutaneous photosensitivity reactions (cell membrane changes). In: *Proceedings of the International Conference on Photosensitization*. University of Tokyo Press, Tokyo, 1973.
Techniques of evaluation of phototoxicity and photoallergy in biologic systems with particular emphasis on immunologic aspects. In: *Proceedings of the International Conference on Photosensitization*. University of Tokyo Press, Tokyo, 1973.
Fundamental and clinical aspects of the porphyrias. In: *Proceedings of the International Conference on Photosensitization*. University of Tokyo Press, Tokyo, 1973.
- Howe, C.; Lloyd, K. O. and Lee, L. T.
The isolation of glycoprotein from red cell membranes using phenol. In: *Methods in Enzymology*. V. Ginsberg, ed. Academic Press, New York, 1972.
- Kappas, A.; Alvares, A. P.; Bickers, D. R.; Levin, W. and Conney, A. H.
The induction of a carcinogen-metabolizing enzyme in human skin. *Trans. Am. Clin. & Clim. A.* 84:125-131, 1973.
- Kroll, Jeffrey J.; Einbinder, Julia M. and Merz, William G.
Mucocutaneous candidiasis in a mother and son. *Arch. Dermat.* 108:259-262, 1973.
- Kroll, J. J.; Shapiro, L.; Koplon, B. S. and Feldman, F.
Subcutaneous sarcoidosis with calcification. *Arch. Dermat.* 106:894, 1972.
- Shapiro, L.; Juhlin, E. A. and Brownstein, M. H.
"Rudimentary polydactyly": An amputation neuroma. *Arch. Dermat.* 108:223, 1973.
- Shapiro, L.; Teisch, J. A. and Brownstein, M. H.
Dermatohistopathology of chronic gonococcal sepsis. *Arch. Dermat.* 107:403, 1973.
- Wagers, L. T.; Shapiro, L. and Kroll, J. J.
Bowen disease of the hand. *Arch. Dermat.* 107:745, 1973.
- Young, Jr., A. W.
Skin complications of heroin addiction—Review and report of a case of bullous impetigo. *New York J. Med.* 73:1681-1684, 1973.
- Young, Jr., A. W. and Sweeney, E. W.
Cutaneous clues to heroin addiction: A portfolio. *Am. Fam. Phys.* 7:79-86, 1973.

Human Genetics and Development

Professor and Chairman of the Department

ROBERT S. KROOTH

Teaching

The Department of Human Genetics and Development is in the fourth full year of its Ph.D. program at the University's Graduate School of Arts and Sciences. Two Ph.D.'s were awarded in the spring of 1973.

The Department offers graduate instruction and research experience in nearly all areas of human genetics and in several important fields of cell differentiation. In addition, the faculty provides postdoctoral training for physicians and scientists interested in genetics, development, and reproduction.

The formal courses offered by the Department include (1) a survey of the medical application of human genetics—a series of lectures intended primarily for sophomore medical students and graduate students in the Department; and (2) a more detailed and extensive course of about 120 hours of lectures covering all aspects of human genetics and several of the newer areas of developmental biology.

In addition, a course in methods of human genetics has recently been added to the curriculum.

Staff Changes

Dr. Howard Levene has been appointed Professor of Human Genetics and Development. Drs. Fred Ramer and Dorothy A. Miller have been promoted to Assistant Professor of Human Genetics and Development.

Dr. Jeffrey Schlom, who had been an assistant professor in the Department, has become a research scientist at the National Cancer Institute. Dr. Rudiger Hehlman, formerly an instructor in the Department, is now a resident in internal medicine at Presbyterian Hospital.

The Department at present has no postdoctoral fellows. Dr. Linda Cantor, previously postdoctoral fellow, has been appointed Staff Associate in the Department. Dr. Leslie Johnson, a former postdoctoral fellow, has taken a position as a research associate at the Sloane-Kettering Institute.

Research associates in the Department include Drs. Vaithilingam G. Dev, Harlow K. Fischman, Ann S. Henderson, Donald J. Komma, Stephanie Phillips, Francesco Ramirez, and Ming Tsung Yu; Julia B. Jones, Selina Kiang, and George Lam are also research associates. Drs. Roberto Gambino and Barry Potvin are staff associates. Predoctoral fellows include Almira Cann, David Colcher, Shahnaz Hashmi, Debra Jarashow, Deborah Katz, Florence Maisonneuve, Julien Mendlewicz, Robert Muller, Jeanne Myers, Tanya Schulz, Rhona Schreck, Dinah Singer, Harvey Stern, and Deborah Vogelman.

Research Activities

In Dr. Atwood's laboratory, study of the iterated genes for ribosomal RNA components has continued. A new hypothesis was advanced to explain individual

variation in the association patterns of human acrocentric chromosomes. This hypothesis is based on the observation that radioactive rRNA anneals to sub-visible connectives between these chromosomes. Comparative mapping of genes for rRNA in human and primate chromosomes indicated that the genes reside in a single pair of chromosomes in catarrhine monkeys and in gibbons, whereas in the chimpanzee, gorilla, and orang, they occupy several pairs, as in man. The genes for the human 5S RNA component were mapped in a single cluster on chromosome 1.

Drs. Arthur Bank, Lois Dow, Masaaki Terada, Clayton Natta, Salvatore Metafora, and Paul Marks have isolated the messenger RNA (mRNA) from β thalassemia reticulocytes and have shown it to direct decreased β globin synthesis when added to cell-free systems. Drs. Daniel Kacian, Sol Spiegelman, Francesco Ramirez, and Roberto Gambino and Drs. Bank, Dow, Natta, and Marks have demonstrated for the first time a quantitative decrease in the amount of β mRNA present in thalassemia cells. This result was obtained by preparing specific radioactive probes for α and β mRNA and measuring the relative amount of hybridization to these probes of α and β mRNA from thalassemia and non-thalassemia cells.

Drs. Bank, Dow, and Maria Guilia Farace, and Ms. Joyce O'Donnell and Ms. Sylvia Ford have compared the biochemical and clinical characteristics of different groups of patients with sickle cell-thalassemia. The results show that the greater the degree of globin chain imbalance, the more severe the anemia.

Drs. Bank, Marks, Natta, and Gulzar Niazi and Ms. Judy Banks have isolated mRNA from bone marrow cells of β thalassemia patients and have shown the mRNA to be deficient in directing β globin synthesis.

Drs. Bank and Farace have demonstrated that the time required to translate a β globin mutant, $\beta^{\text{Riverdale-Bronx}}$, is similar to that of normal β^A chains.

Dr. Richard A. Rifkind, with Dr. Linda N. Cantor, has been studying the effects of the hormone erythropoietin on the rate of cell division in erythroid cell precursors. With Drs. Joseph Levy and Marvin C. Cooper, methods for the colonial growth of erythroid precursor cells have been developed and employed in studies on the regulatory effects of erythropoietin on cell differentiation. With Mr. Eric White, a fourth-year medical student, an *in vitro* assay for erythropoietin employing cultured precursor cells has been developed.

Dr. Maniatis has investigated the effect of inhibiting DNA synthesis and mitosis on the action of ery-

thropoietin in cultures of mouse fetal erythroid precursor cells.

Dr. Georgiana Jagiello has continued her studies of female mammalian meiosis. Cytogenetic investigation of 500 human oöcytes has revealed a chiasmata frequency higher than those in all other female mammals studied thus far. The human oöcytes contained no structural rearrangements but did reveal one example of a univalent for the G group in 229 second metaphase cells, which corresponds to an incidence of less than the overall estimate of 1:668 for trisomy G in live newborns. A parallel study with Dr. J. S. Fang of mitotic complements of ovarian material has demonstrated that in females over age 30, there is a significant increase in cells which have lost one X chromosome.

Dr. Jagiello has completed and published meiotic analyses of oöcytes from many infrahuman species. These studies should permit the development of a valid infrahuman model for identifying agents which derange meiosis. The evaluation of the effect of many potential environmental mutagens on mammalian eggs has continued, and reports of the effects of mercury, caffeine, and tranquilizers have been published. Data on the question of the reported mutagenicity of the most commonly used oral contraceptives have been accumulated for monkey, sheep, cow, and mouse oöcytes. A retrospective analysis of human material is in progress.

Dr. Krooth and his associates have continued their studies on regulation of the enzymes concerned with pyrimidine synthesis in cultured diploid human fibroblasts. They have obtained evidence that an intermediate in the synthetic sequence is essential for the maintenance of enzyme activity for the final two enzymes in the pathway leading to uridine 5'-monophosphate. When the synthesis of this intermediate is inhibited, enzyme activity goes down, and when the subsequent metabolism of the intermediate is inhibited, cellular enzyme activity goes up. These effects can be demonstrated not only in normal cells but also in cells homozygous for Mendelian mutations which reduce the basal level of enzyme activity. The changes in enzyme activity attributable to changes in the cellular concentration of intermediate are quite large and may reflect a regulatory mechanism that normally operates in fibroblasts. Some evidence has been obtained which suggests that when extremely high levels of intermediate accumulate in the cell, a new pair of enzyme activities, not normally found in fibroblasts, appears. In another program Dr. Krooth and Ms. E. K. Sell have found that there are major differences in regulation of galactose metabolism between cultured human cells and bacter-

cells: In normal human fibroblasts, the three principal enzymes involved in the conversion of galactose to glucose do not appear to change in a fixed ratio to one another and are not induced by galactose. Finally, Dr. Krooth's laboratory, with Dr. Marks' laboratory, is engaged in experiments aimed ultimately at the antenatal diagnosis of the human hemoglobinopathies.

Drs. O. J. Miller and Elvin A. Kabat are continuing efforts to obtain lines of human mucosal cells which secrete blood group A, B, H, Le^a, Le^b, or I substances. Dr. Stephanie Phillips, formerly at Washington University, has joined the group to participate in this research. An effort will be made to establish which chromosomes control the biosynthesis of blood group substances. Ms. Florence Maisonrouge, a graduate student in the Department, has been isolating and characterizing oligosaccharide fragments of the blood group substance in fluid from a human ovarian cyst obtained from Nigeria. By means of studies on the degradation of these materials, insight into the heterogeneity of soluble blood-group-specific substances will be obtained. For further information, see the report of the Department of Microbiology.

Dr. O. J. Miller and his associates have continued their efforts to assign genes to specific chromosomes in man and mouse. They are also continuing to develop new chromosome banding techniques and are applying them to cytogenetic analysis of somatic cell hybrids and tissue culture cell lines from several animal species. With Dr. Bernard F. Erlanger (Microbiology), Dr. Miller and his associates are continuing to use antibodies to purine or pyrimidine bases of DNA as molecular probes of fixed mammalian chromosomes.

Dr. D. A. Miller, with Drs. P. W. Allderdice, V. G. Dev, O. J. Miller, M. S. Grewal, J. J. Hutton, D. Warburton, and J. Klein (Department of Human Genetics, University of Michigan, Ann Arbor) and Ms. S. Hashmi, has verified the assignment of five linkage groups to specific chromosomes in the mouse, using a series of translocations. Drs. D. A. Miller, V. G. Dev, O. J. Miller, and Carmia Borek (Radiology), have worked out the detailed banded karyotype of the laboratory rat and have shown karyotype changes in transformed or malignant cells. They have obtained international agreement on a standard banded karyotype for the rat.

Dr. John Rainer and his associates at the Psychiatric Institute have investigated genetic aspects of manic-depressive psychosis and of schizophrenia. In the former condition, Dr. Julien Mendlewicz, with Drs. Rainer and Ronald Fieve, has reported on the genetic risk among first-degree relatives of manic-

depressive patients. The degree of risk and sex distribution fit best an X-linked dominant pattern, though there is clearly some heterogeneity in the total genetic picture. These results parallel the linkage studies, previously reported and further substantiated during the current year by the inclusion of new informative families. The clinical importance of these studies is illustrated by the further finding (Drs. Mendlewicz, Fieve, and Frank Stallone) that response to lithium treatment is more probable in patients with a positive family history.

In schizophrenia, Dr. L. Erlenmeyer-Kimling with Dr. Rainer completed the first stage of a prospective study of children of schizophrenic parents. The object has been to define early behavioral and neurological signs in the premorbid history of high-risk children for use in screening and preventive programs.

The main research activities of Dr. Sol Spiegelman are summarized in the report of the Institute of Cancer Research.

The investigations of Dr. Sidney Udenfriend and his colleagues are in three areas. In the area relating to the biochemistry of the sympathetic nervous system they have developed chemical and radioimmunoassays for dopamine- β -hydroxylase in human blood and have shown that liver and kidney aromatic-L-amino acid decarboxylase may play a major role in the metabolism of phenylalanine, tyrosine, and tryptophan under certain conditions. In the area of collagen biosynthesis they have discovered and characterized a precursor form of prolyl hydroxylase and have demonstrated increased collagen synthesis in blood vessels as an early sign of arteriosclerosis in hypertensive rats. In the area of fluorescence analysis they have made further applications of the newly discovered reagent fluorescamine to the assay of amino acids, peptides, and proteins in the picomole range.

Dr. Warburton has completed an analysis of the spatial relations of chromosomes on the metaphase plate. As part of a study on chromosome evolution in primates (which also involves *in situ* hybridization carried out by Dr. Atwood's laboratory), the banding patterns of chromosomes in the chimpanzee and other primates have been compared with those of man.

Dr. Arthur Weissbach has studied the role of DNA polymerases in the replication of the chromosomes of the mammalian cell. One class of these enzymes, designated R-DNA polymerases, has been found to rise in activity at the onset of DNS synthesis. This may indicate a role for this type of enzyme in the initiation or early stages of DNA replication. Another DNA polymerase, designated

D-DNA polymerase II, rises maximally in activity during the later stages of DNA replication. These results support the hypothesis that the replication of DNA may occur in steps, each of which requires a specific DNA polymerase. Cells infected with viruses such as herpes or vaccinia contain a new DNA polymerase which is specified by each virus. These new polymerases have been isolated and characterized, and their role in viral DNA replication is being studied.

A major interest of Dr. Herbert Weissbach has concerned the mechanism of protein synthesis in both eukaryote and prokaryote systems. These studies include initiation in animal and bacterial systems, the mechanism of peptide chain elongation, and the role of ribosomal proteins in polypeptide synthesis. Specifically, elongation factor 1 from animal tissues has been purified and found to be present in multiple forms that vary in molecular weight. The heavy form of the factor appears to be an aggregate of the light form and contains cholesterol and its derivatives. The role of ribosomes and initiation factors in the DNA-directed *in vitro* synthesis of proteins has also been investigated with the ultimate aim of obtaining a completely defined system to study this process. During the course of these studies factors not previously described have been separated. These factors are essential for protein synthesis in this system.

Clinical Service

The Department maintains a small clinical laboratory, under the immediate direction of Dr. Dorothy Warburton, for medical cytogenetics. Dr. Rainer directs a genetic counselling and diagnostic unit at the Psychiatric Institute. In addition, several members of the Department, on an informal basis, counsel patients who have, or believe they have, hereditary diseases in their family; this service is at present rendered on an extremely small scale. We expect that within the next year the Department will be able to provide expanded consultant service to patients in the Medical Center who are referred either for counselling or for the verification of a suspected enzymatic or chromosomal abnormality.

In addition, plans are being developed for a program, to be administered jointly with other departments, devoted to the antenatal diagnosis of genetic disease.

Acknowledgments

The Department of Human Genetics and Development is grateful for the generosity of the following donors: Atomic Energy Commission; National Institutes of Health; National Foundation; National Science Foundation; American Cancer Society; Cooley's Anemia Blood and Research Foundation for Children, Inc.; Leukemia Society, Inc.; RGK Foundation; Robert Lehman Foundation; Roche Institute of Molecular Biology; Rockefeller Foundation; and Mr. and Mrs. John Galt.

1973 Publications

Human Genetics and Development

- Allderdice, P. W.; Miller, O. J.; Miller, D. A.; Jagiello, G. M. and Miller, O. J.
Meiotic confirmation of the identification of chromosomes 9 and 13 in T(9;19)163H, T(5;13)264Ca, and T(1;13)70H stocks in *Mus musculus*. *Chromosoma* **41**:103-110, 1973.
- Allderdice, P. W.; Miller, O. J.; Miller, D. A.; Warburton, D.; Pearson, P. L.; Klein, G. and Harris, H.
Chromosome analysis of two related heteroploid mouse cell lines by quinacrine fluorescence. *J. Cell Sc.* **12**:263-274, 1973.
- Bank, A.; Dow, L. W.; Farace, M. G.; O'Donnell, J. V.; Ford, S. and Natta, C. L.
Changes in globin synthesis with erythroid cell maturation in sickle-thalassemia. *Blood* **41**:353-357, 1973.
- Bank, A. and Marks, P. A.
Thalassemia syndromes and intracellular regulation of globin synthesis. *Med. Clin. North America* **57**:303-313, 1973.
- Bartalos, M. and Rainer, J. D.
Human chromosome mapping with an ammoniacal silver staining procedure. *Acta Genet. Med. Gemellol. (Roma)* **21**:139-142, 1972.
- Blum, J. E.; Clark, E. T. and Jarvik, L. F.
The New York Psychiatric Institute study of aging twins. In: *Intellectual Functioning in Adults*. L. F. Jarvik, C. Eisdorfer, and J. Blum, eds. Springer Publishing Co. Inc., New York, 1973.
- Böhlen, P.; Stein, S.; Dairman, W. and Udenfriend, S.
Fluorometric assay of proteins in the nanogram range. *Arch. Biochem. Biophys.* **155**:213-220, 1973.
- Bolden, A.; Fry, M.; Muller, R.; Citarella, R. and Weissbach, A.
The presence of a polyribadenylic acid dependent DNA polymerase in eukaryotic cells. *Arch. Biochem. Biophys.* **153**:26, 1972.
- Boyer, S.; Scher, W.; Preisler, H.; Friend, S. and Bank, A.
Hemoglobin biosynthesis in murine virus induced cells *in vitro*. *Blood* **40**:823-835, 1972.

- Brot, N.; Marcel, R.; Cupp, L. and Weissbach, H.
The enzymatic acetylation of ribosomal-bound protein L₁₂. *Arch. Biochem. Biophys.* **155**:475, 1973.
- Brunschede, H. and Krooth, R. S.
Studies on the xanthine oxidase activity of mammalian cells. *Biochem. Genet.* **8**:341-350, 1973.
- Cardinale, G. J. and Udenfriend, S.
In: *Oxidases and Related Redox Systems (Proc. 2nd Int. Symp.)*. T. E. King, H. S. Mason and M. Morrison, eds. University Park Press, Baltimore, Md., 1973.
- Chatterjee, N. K.; Koch, G. and Weissbach, H.
Initiation of protein synthesis *in vivo* in poliovirus-infected HeLa cells. *Arch. Biochem. Biophys.* **154**:431, 1973.
- Chatterjee, N. K. and Weissbach, H.
Release of RNA from HeLa cell nuclei. *Arch. Biochem. Biophys.* **157**:160, 1973.
- Chuang, D. M. and Weissbach, H.
Effect of eukaryote DNA on amino acid incorporation in extracts of *E. coli*. *Arch. Biochem. Biophys.* **157**:28, 1973.
- Citarella, R. V.; Muller, R.; Schlabach, A. and Weissbach, A.
Studies on vaccinia virus directed DNA polymerase. *J. Virol.* **10**:721, 1972.
- Cox, G. S.; Thomas, E.; Kaback, H. R. and Weissbach, H.
Synthesis of cyclopropane fatty acids in isolated bacterial membranes. *Arch. Biochem. Biophys.* **158**:667, 1973.
- Dev, V. G.; Miller, D. A.; Hashmi, S.; Warburton, D.; Miller, O. J. and Klein, J. G.
The biarmed *M. poschiavinus* chromosome carrying the H-2 locus, *TlposKlj*, is *T7Bnr*. *Genetics* **72**:541-543, 1973.
- Dow, L. W.; Terada, M.; Natta, C.; Metafora, S.; Grossbard, E.; Marks, P. A. and Bank, A.
Studies on thalassemia syndromes: globin synthesis by intact cells and activity of isolated mRNA. *Nature* **243**:114-116, 1973.
- Erlenmeyer-Kimling, L.
Gene-environment interactions and the variability of behavior. In: *Genetics, Environment, and Behavior: Implication for Educational Policy*. L. Ehrman, G. Omenn, and E. Caspari, eds. Academic Press, New York, 1972.
Comments on past and present in genetic research on schizophrenia. *Psychiat. Quart.* **46**:363-370, 1972.
- Farace, M. G. and Bank, A.
Control of human hemoglobin synthesis: Translation of globin chain in heterozygotes with hemoglobin Riverdale-Bronx. *Biochim. Biophys. Acta* **312**:591-597, 1973.
- Fieve, R. R.; Meltzer, H.; Dunner, D. L.; Levitt, M.; Mendlewicz, J. and Thomas, A.
Rubidium: Biochemical, behavioral and metabolic studies in humans. *Am. J. Psychiat.* **130**:55-60, 1973.
- Fry, M. and Weissbach, A.
A new DNA dependent DNA polymerase from HeLa cell mitochondria. *Biochemistry* **12**:3602, 1973.
- The utilization of synthetic DNA templates by a new DNA polymerase from cultured murine cells. *J. Biol. Chem.* **248**:2678, 1973.
- Grossbard, E. G.; Terada, M.; Dow, L. W. and Bank, A.
Decreased α mRNA activity associated with polyribosomes in α thalassemia. *Nature* **241**:209-211, 1973.
- Hayakawa, T. and Udenfriend, S.
A simple radioisotope assay for microsomal aryl hydroxylase. *Anal. Biochem.* **51**:501-509, 1973.
- Henderson, A. S.; Warburton, D. and Atwood, K. C.
Location of rDNA in the human chromosome complement. *Proc. Nat. Acad. Sc. (USA)* **69**:3394-3398, 1972.
Ribosomal DNA connectives between acrocentric chromosomes. *Nature* **245**:95-97, 1973.
- Jagiello, G.
Review of *Oögenesis*, edited by Biggers and Schuetz. *J. Med. Genet.*, London, 1973.
- Jagiello, G. and Ducayen, M.
Meiosis of ova from polyovular (C⁵⁸/J) and polycystic (C⁵⁷/L/J) strains of mice. *Fertil. & Steril.* **24**:10-14, 1973.
- Jagiello, G.; Ducayen, M. B. and Lin, J. S.
A meiotic cytogenetic study of a commonly used tranquilizer reported to concentrate in mammalian follicular fluid. *Teratology* **7**:17-22, 1973.
- Jagiello, G.; Ducayen, M.; Miller, W.; Lin, J. S. and Fang, J. S.
A cytogenetic analysis of ova from *Macaca mulatta* and *nemestrina* matured *in vitro*. *Humangenetik* **18**:117-122, 1973.
- Jagiello, G. and Lin, J. S.
An assessment of the effects of mercury on the meiosis of mouse ova. *Mutation Res.* **17**:93-99, 1973.
Studies on the process of mouse meiosis and ovulation with daunomycin. *Experientia* **29**:114-117, 1973.
- Kacian, D.; Gambino, R.; Dow, L. W.; Grossbard, E.; Natta, C.; Spiegelman, S.; Marks, P. A. and Bank, A.
Decreased globin messenger RNA in thalassemia detected by molecular hybridization. *Proc. Nat. Acad. Sc. (USA)* **70**:1886-1890, 1973.
- Krooth, R. S.
The action of mutant Mendelian genes in human diploid cell strains, in Proc. IV International Congress of Human Genetics. *Excerpta Med.* **233**:104, 1971.
- Krooth, R. S.; Pan, Y. L. and Pinsky, L.
Studies of the orotidine-5'-monophosphate decarboxylase activity of crude extracts of human cells. *Biochem. Genet.* **8**:133-148, 1973.
- Krooth, R. S. and Sell, E. K.
Characteristics of fibroblasts cultured from patients with galactosemia or galactokinase deficiency. In: *Tissue Culture Methods and Applications*. P. F. Kruse and M. K. Patterson, eds. Academic Press, New York, 1973.
- Kung, H. F.; Fox, J. E.; Spears, C.; Brot, N. and Weissbach, H.
Studies on the role of ribosomal proteins L₇ and L₁₂ in the *in vitro* synthesis of β -galactosidase. *J. Biol. Chem.* **248**:5012, 1973.

- McGee, J. O'D.; Jiminez, M. H.; Felix, A. M.; Cardinale, C. J. and Udenfriend, S.
Inhibition of prolyl hydroxylase activity by bradykinin analogs containing a prolyl-like residue. *Arch. Biochem. Biophys.* 154:483-487, 1973.
- Marks, P. A.
Thalassemia syndromes. *Pahlavi Med. J.* 3:499-511, 1972.
- Mendlewicz, J.; Fleiss, J. L. and Fieve, R. R.
Evidence for X-linkage in the transmission of manic-depressive illness. *J.A.M.A.* 222:1624-1627, 1972.
- Mendlewicz, J.; Fieve, R. R.; Rainer, J. D. and Cataldo, M.
Affective disorders on paternal and maternal sides: Observations in bi-polar (manic-depressive) patients with and without a family history. *Brit. J. Psychiat.* 122:31-34, 1973.
- Mendlewicz, J.; Fieve, R. R. and Stallone, F.
Relationship between the effectiveness of lithium therapy and family history. *Am. J. Psychiat.* 130:1011-1013, 1973.
- Miller, D. A.; Allderice, P. W.; Kouri, R. E.; Dev., V. G.; Grewal, M. S.; Miller, O. J. and Hutton, J. J.
Quinacrine fluorescent chromosome analysis of the Snell translocation in the mouse. *Genetics* 71:633-637, 1972.
- Miller, D. L.; Cashel, M. and Weissbach, H.
The interaction of guanosine 5'-diphosphate, 2' (or 3'-) diphosphate with the bacterial elongation factor EFTu. *Arch. Biochem. Biophys.* 154:675, 1973.
- Miller, D. A.; Dev, V. G.; Borek, C. and Miller, O. J.
The quinacrine fluorescent and Giemsa banding karyotype of the rat, *Rattus norvegicus*, and banded chromosome analysis of transformed and malignant rat liver cell lines. *Cancer Res.* 32:2375-2382, 1972.
- Miller, D. A. and Miller, O. J.
Chromosome mapping in the mouse. *Science* 178:949-955, 1972.
- Miller, O. J.
Committee for a standardized karyotype of *Rattus norvegicus*: Standard karyotype of the Norway rat, *Rattus norvegicus*. *Cytogenet. Cell Genet.* 12:199-205, 1973.
Heterochromatin visualized by various techniques. In: *Symposia Medica Hoechst 6, Modern Aspects of Cytogenetics: Constitutive Heterochromatin in Man*, 1973, pp. 135-148.
- Miller, O. J.; Miller, D. A. and Warburton, D.
New staining techniques and the human chromosomes. In: *Progress in Medical Genetics*. A. Steinberg and A. Bearn, eds. Grune & Stratton, New York, 1973.
- Miller, O. J.; Schreck, R. R.; Beiser, S. M. and Erlanger, B. F.
Immunofluorescent studies of chromosome banding with anti-nucleoside antibodies. In: *Nobel Symposium XXIII. Chromosome Identification, Techniques and Applications in Biology and Medicine*, 1973, pp. 43-48.
- Galley 21—Human Genetics & Development**
Miller, W. A. and Jagiello, G.
Gonadotropin dependency of isolated ovine ovarian follicles cultured *in vitro*. *Fertil. & Steril.* 24:609-617, 1973.
- Natta, C.; Banks, J.; Niazi, G.; Marks, P. A. and Bank, A.
Decreased β globin messenger RNA activity in bone marrow cells in homozygous and heterozygous β thalassemia. *Nature* 244:280-281, 1973.
- Naylor, A. F.; Warburton, D. and Warburton, F. E.
Spatial relations of human chromosomes identified by quinacrine fluorescence at metaphase. II. Analysis of variance of intercentromeric distances. *Humangenetik* 18:307-313, 1973.
- Parker, R. J.; Allderice, P. W.; Miller, O. J. and Schildkraut, C. L.
Replication pattern and quinacrine fluorescence of the chromosomes of a CV-1-derived green monkey cell line. *Cytogenet. Cell Genet.* 12:93-106, 1973.
- Rainer, J. D.
Genetic counseling in a psychiatric setting. In: *Handbook of Psychiatric Therapies*. J. H. Masserman, ed. Science House, New York, 1972.
Perspective on the genetics of schizophrenia: A re-evaluation of Kallmann's contribution—Its influence and current relevance. *Psychiat. Quart.* 46:356-362, 1972.
- Rifkind, R. A.; Cantor, L. N.; Cooper, M. C.; Singer, D.; Maniatis, G. M. and Marks, P. A.
Culture of normal and malignant erythropoietic precursor cells from fetal and adult mice. *Proc. Second International Workshop on Hemopoiesis in Culture*, Warrenton, Virginia, 1973.
- Schreck, R. R.; Warburton, D.; Miller, O. J.; Beiser, S. M. and Erlanger, B. F.
Chromosome structure as revealed by a combined chemical and immunochemical procedure. *Proc. Nat. Acad. Sc. (USA)* 70:804-807, 1973.
- Sell, E. K. and Krooth, R. S.
Tabulation of somatic cell hybrids formed between lines of cultured mammalian cells. *J. Cell Physiol.* 80:453-461, 1972.
- Stallone, F.; Shelley, E.; Mendlewicz, J. and Fieve, R. R.
Lithium prophylaxis in affective disorders: III. A double blind study. *Am. J. Psychiat.* 130:1006-1010, 1973.
- Stassen, F. L. H.; Cardinale, G. J. and Udenfriend, S.
Activation of prolyl hydroxylase in L-929 fibroblasts by ascorbic acid. *Proc. Nat. Acad. Sc. (USA)* 70:1090-1093, 1973.
- Stein, S.; Böhlen, P.; Stone, J.; Dairman, W. and Udenfriend, S.
Amino acid analysis with fluorescamine at the picomole level. *Arch. Biochem. Biophys.* 155:203-212, 1973.
- Tamura, Z.; Nakajima, T.; Nakayama, T.; Pisano, J. J. and Udenfriend, S.
Identification of peptides with 5-dimethylaminonaphthalenesulfonyl chloride. *Anal. Biochem.* 52:595-606, 1973.

- Terada, M.; Cantor, L.; Rifkind, R. A.; Bank, A. and Marks, P. A.
Globin mRNA activity in erythroid precursor cells and the effect of erythropoietin. *Proc. Nat. Acad. Sc. (USA)* **69**:3535, 1972.
- Thomas, E. L.; Weissbach, H. and Kaback, H. R.
Studies on the metabolism of ATP by isolated bacterial membranes: Solubilization and phosphorylation of a protein component of the diglyceride kinase system. *Arch. Biochem. Biophys.* **157**:327, 1973.
- Udenfriend, S.; Christenson, J. G. and Dairman, W.
Decarboxylation of 5-hydroxytryptophan. Pharmacology and the future of Man, 5th International Congress of Pharmacology, San Francisco, 1972. **4**:245-256, 1973.
- Warburton, D., Firschein, I. L., Henderson, A. and Dev, V. G.
Comparison of human and chimpanzee karyotypes. (Abstract.) *Genetics* **74**: (Suppl. 2): 291, 1973.
- Warburton, D.; Henderson, A. S.; Shapiro, L. R. and Hsu, L. Y. F.
A stable human dicentric chromosome, t dic (12;14) (p13;p13) including an intercalary satellite region between centromeres. *Am. J. Human Genet.* **25**:439-445, 1973.
- Warburton, D.; Naylor, A. F. and Warburton, F. E.
Spatial relations of human chromosomes identified by quinacrine fluorescence at metaphase. I. Mean interchromosomal distances and distances from the cell center. *Humangenetik* **18**:297-306, 1973.
- Weissbach, A.; Hong, S. C.; Aucker, J. and Muller, R.
Characterization of herpes simplex virus induced DNA polymerase. *J. Biol. Chem.* **248**:6270, 1973.
- Weissbach, H.; Redfield, B. and Moon, H. M.
Further studies on the interactions of elongation factor I from animal tissues. *Arch. Biochem. Biophys.* **156**:267, 1973.
- Wilmotte, J. and Mendlewicz, J.
Epidemiology of suicidal behavior in one thousand Belgian prisoners. In: *Jail House Blues—Studies of Suicidal Behavior in Jail and Prison*. B. L. Danto, ed. Epic Publishing Co., Orchard Lake, Michigan, 1973.

Medicine

CHARLES A. RAGAN

Lambert Professor and Chairman of the Department

Director of Service

Several forces are exerting a major influence on medical schools and teaching hospitals. The emphasis on cost permeates the scene in areas of health care, as in undergraduate and graduate training. The Department is making every effort to maintain excellence in care and teaching while keeping the cost factor in mind.

Changes in Staff

Dr. Dickinson W. Richards died on February 23, 1973. He was a graduate of P&S and his distinguished career encompassed service at Presbyterian and at Bellevue. A Nobel laureate, he was a staunch supporter of the cardiopulmonary division, with which he had been associated since its inception. Dr. Julia M. Jones died on April 23, 1973. Her work in chest disease at Bellevue and Harlem was nationally known. Dr. Robert F. Loeb, Chairman of the Department from 1947 to 1960, died on October 21, 1973. Internationally recognized as a leader in medicine, his firm support of the values this Department stands for will be sorely missed. Dr. Arthur E. Neergaard died on May 21, 1973 and Dr. Henry P. Colmore, on November 13, 1973.

Honors

Dr. André F. Cournand delivered an invited lecture in Tokyo on the scientist's code and gave the first Dickinson W. Richards Lecture at the annual meeting of the American Heart Association. Dr. Vincent P. Butler, Jr., was awarded the Joseph Mather Smith Prize from P&S. Dr. Paul A. Marks served as the Carl R. Moore Lecturer at Washington

University and was elected to the National Academy of Sciences. He is serving as Chairman of the Executive Committee, Division of Medical Sciences, of the National Academy and as President of the Harvey Society. Dr. John H. Laragh is President-Elect of the Medical Board of Presbyterian Hospital. He served as Visiting Physician-in-Chief Pro Tem at the Peter Bent Brigham Hospital in Boston. Dr. Stanley E. Bradley gave invited lectures in Australia and Italy and ended his term as President of the New York Heart Association. Dr. Frances J. Morgan, a visiting scholar in the Department for four years, returned to Melbourne, Australia to be Director of Research in Molecular Biology at St. Vincent's School of Medical Research. Dr. Sidney C. Werner completed his term as President of the American Thyroid Association and lectured in Greece and the Netherlands. Dr. DeWitt S. Goodman was elected a councillor of the American Society for Clinical Investigation and was on sabbatical leave in Cambridge, England and Stockholm, Sweden. Dr. E. Carwile LeRoy serves as President of the New York Rheumatism Association and Dr. Dudley F. Rochester, as President of the Eastern Section of the American Thoracic Society.

The following serve on study sections or committees of the N.I.H.: Drs. Arthur Bank, J. Thomas Bigger, Paul J. Cannon, Andrew G. Frantz, Jane H. Morse, Elliott F. Osserman, Donald H. Schmidt, and I. Bernard Weinstein. Drs. Robert E. Canfield, Weinstein, and Frantz serve on committees of the National Academy of Sciences. Drs. Butler, Bradley, M. Irené Ferrer, John Lindenbaum, Cannon, Rochester,

Gerard M. Turino and LeRoy serve on scientific committees of voluntary health agencies.

Teaching

Dr. Canfield took over responsibility as course director of Abnormal Human Biology from Dr. Richard A. Rifkind, who initiated the course four years ago. This second-year course, organized around clinical material, has proved an effective and popular format for introducing clinical medicine. The Department is indebted to Dr. Rifkind for this innovation in the curriculum.

During the past year, the Department's Curriculum Committee examined the influence on the medical clinical clerkship of the two new major preclinical courses, Introduction to the Patient and Abnormal Human Biology. The possibility was particularly considered that these courses might make the clerkship too repetitious and therefore obsolete. The Committee, including members of the fourth-year class, unanimously agreed that emphasis on the basic goals of the clerkship should not only be maintained but reinforced.

During the medical clerkship, students can develop skills in history taking, physical examination, and interpretation of laboratory data. These basic skills require repeated effort, intimate contact with patients, and exposure to faculty capable of teaching both by example and by constructive criticism. Only on this basis can students achieve the appropriate perspective and integrative approach to the sick individual. The preceptor system in the Department of Medicine, with its unique input of time by more than 75 members of the faculty at the four major teaching hospitals, continues to provide the best setting for instruction of medical students in these critical skills. The Curriculum Committee concluded that only in this atmosphere of closely guided instruction and constant inquiry would the basic information conferred by Introduction to the Patient and Abnormal Human Biology be translated into adequate clinical skills.

An additional factor affecting the clerkship was the involvement of the medical services of Harlem, Roosevelt, and St. Luke's Hospitals in the teaching program. Each student now spends six weeks at Presbyterian Hospital and six weeks at one of the affiliated hospitals. To prevent fragmentation of teaching and to maintain a departmental focus of the course despite the moves, quarterly meetings of all involved preceptors are held with the course director to review the goals of the clerkship and to acquaint preceptors from different hospitals with one another. This communication between precep-

tors is maintained. Every student receives the benefit of multiple evaluations and those deserving honors rating are selected on the basis of their overall record.

Dr. Thomas Q. Morris became course director of the Major Clinical Year Clerkship, replacing Dr. Donald F. Tapley, to whom the Department is indebted for his great efforts.

Medical Electives

During 1972 and 1973, a major effort was mounted to improve the elective program. All courses were reviewed to assure that they were organized to provide a meaningful rotation for students. Course directors were asked to evaluate students' performance at the end of each elective, and students, to complete rating sheets which are filed with the Dean and thus available to other students.

Drs. Harold C. Neu and Ann S. Peterson meet with students prior to selection of electives. Students who elect medicine were advised to arrange a program that would include as a minimum: (1) ward subinternship, two months (Delafield highly recommended); (2) medical clinic, one month (Group or equivalent); (3) subspecialty rotation, two months. In 1971-72, 56 per cent of student elective time was taken in medicine.

Medical subspecialty electives in several areas were consistently oversubscribed but efforts are under way to broaden these areas by greater utilization of programs at the affiliated hospitals.

Patient Care

Occupancy on the Medical Service remains at a high level. During 1973, 5,626 patients were cared for on the Medical Service with an average stay of 14.4 days. A total of 22,608 new patients was seen in Admitting Emergency, in the course of 9,756 visits to the Clinic. The group and medical clinics accommodated 8,723 new patients. Of interest is the steady increase in the number of admissions to the wards of the Medical Service from 1968 to 1972 and the steady decrease in average length of stay.

Ward Medical Admissions
(Excluding 9 Metabolism)
1968 to 1972

Beds (101)	Admissions	Patient Days Care	Average Days/Adm.
1972	2,294	32,454	14.15
1971	2,196	32,962	15.01
1970	2,003	32,173	16.06
1969	1,718	31,148	18.13
1968	1,904	34,411	18.07

A geographical full-time group practice, the Medical Ambulatory Care Service, was formed within the Division of Ambulatory Care and is staffed by Drs. Kenneth M. Prager and Harvey A. Schneier. They assumed responsibility for the on-going training and supervision of four medical nurse practitioners, who with the assistance of Ms. Elizabeth G. Loeb, handle all of the Admitting-Emergency daytime screening load and provide definitive primary care for most patients with "nonemergency" medical problems. Didactic and case-study (chart review) methods are used for instructing interns and residents in Admitting Emergency to supplement the ready availability of these attendings for clinical consultation during weekday hours. The addition of two physicians, expected in July 1974, will permit consolidating the current program and extending it to include General Medical Clinic, the Admitting (Overnight) Ward, and Group Clinic. It is hoped that the Nurse Practitioner Program may be extended to Group Clinic, allowing such professionals to assist Dr. John V. B. Dean in long-term management of patients with chronic disease, thereby allowing the Clinic's other attending physicians to concentrate on teaching medical students and evaluating and stabilizing new patients. An elective for medical students comprising experience in each of the above clinics is being designed.

Research Activities

Dr. LeRoy continued studies of the mechanisms of vascular damage and fibrosis characteristic of rheumatic disease. Drs. John E. McWhorter, John A. Downey (Rehabilitation Medicine), and LeRoy defined patterns of microcirculatory responses in several disease states. The scleroderma skin fibroblast produces collagen in excessive amounts, and Dr. Roy M. Fleischmann studied the profile of collagen chains synthesized by scleroderma fibroblasts in tissue culture. Drs. Yale Enson, Rejane M. Harvey, Carol H. Bosken, Henry M. Thomas III, John A. Wood, and LeRoy studied selected hemodynamic parameters of the pulmonary circulation of patients with this disease. Drs. Hildegard R. Maricq and LeRoy characterized three distinctive nailfold capillary patterns in scleroderma-dermatomyositis, systemic lupus erythematosus, and rheumatoid arthritis. Drs. McWhorter and LeRoy analyzed 15 cases of pericardial involvement in scleroderma. Drs. Enson, Wood, and Harvey studied the contribution of changes in heart rate to the level of pulmonary hypertension in an animal model of chronic bronchitis. Drs. Peter B. Caldwell and Ronald L. Nagel (Albert Einstein) demonstrated that human hemo-

globin changes in its quaternary conformation when only two paired heme groups are liganded. Dr. Caldwell collaborated with Drs. Richard L. Soffer (Albert Einstein) and Robert J. Reza in isolating and purifying angiotensin-converting enzyme from the particulate portion of the lung. They also demonstrated that this physiologically important enzyme catalyzes the degradation of bradykinin. With Drs. Charles E. Blair III and Harry W. Fritts, Jr., Dr. Thomas investigated control of pulmonary blood flow in an animal model of sarcoidosis.

Dr. Gerard M. Turino is Principal Investigator of a multidisciplinary program project awarded by the National Heart and Lung Institute. The objectives of this program are to define the interrelationship of physiological performance, biochemical composition, and chemical potential of specific cells in the lung to determine mechanisms of injury and destruction in acute and chronic diseases of the lung. Participating with Dr. Turino are Drs. Ines Mandl and Stephen Keller (Biochemistry, Obstetrics and Gynecology), Lowell M. Greenbaum (Pharmacology), Richard M. Skalak and Maciej P. Bienick (Civil Engineering), and Mary S. Parshley and Joshua A. Fierer (Pathology).

Dr. Dudley F. Rochester continued to explore the mechanisms by which the diaphragm sustains high levels of ventilatory work. Unlike blood flow to other skeletal muscle, that to the diaphragm is well preserved at near maximal work rates. Drs. Rochester and Norma M. T. Braun are investigating the effects of respirator therapy on the respiratory muscles. They found respiratory muscle weakness in patients with obstructive lung disease and acute respiratory failure. Drs. Rochester, Marc H. Laviates, Braun, and Mr. William D. Powlis (P&S '73) investigated the sensitivity of simple spirometric tests in detecting early airway disease.

Dr. Bank continued studies to determine the molecular defect in the thalassemia syndromes. With Drs. Lois W. Dow, Masaaki Terada, Clayton L. Natta, Salvatore Metafora, and Paul A. Marks, the messenger RNA (mRNA) isolated from β thalassemia reticulocytes was shown to direct decreased β globin synthesis when added to cell-free systems. With Drs. Daniel L. Kacian, Sol Spiegelman, Francesco Ramirez, and Roberto Gambino (all of Human Genetics and Development) and Drs. Dow, Natta, and Marks, a quantitative decrease in the amount of β mRNA present in β thalassemia cells was demonstrated. With Drs. Marks, Natta, Gulzar A. Niazi and Julia Banks Jones, mRNA was isolated from bone marrow cells of β thalassemia patients and shown to be deficient in directing β globin synthesis.

Dr. John Lindenbaum with Dr. Charles D. Gerson (Mt. Sinai) and Mr. Edward H. Lowe (P&S '74) is studying absorption of digoxin in patients with bowel resection and malabsorption syndromes. With Dr. Frederic O. Finkelstein (Yale University), he studied the absorption of digoxin in patients with chronic renal failure. With Dr. John F. Pezzimenti, he undertook an investigation of the effects of untreated vitamin B₁₂ and folic acid deficiency on intestinal absorption in man. In collaboration with Drs. Charles Lieber and Emanuel Rubin (Mt. Sinai School of Medicine), Dr. Lindenbaum continued studies of the effects of alcohol administration on intestinal morphology and on vitamin B₁₂ absorption in human volunteers and in rats. With Ms. Nancy Whitehead (New York University), he demonstrated that in 20 per cent of women taking oral contraceptive drugs, subtle "megaloblastic" cytologic changes in cervical smears can be demonstrated which respond to therapy with folic acid.

Dr. Rifkind, with Dr. Linda N. Cantor (Human Genetics and Development), has been studying the effects of the hormone erythropoietin on the rate of cell division in erythroid cell precursors. With Drs. Joseph Levy and Marvin C. Cooper, methods for the colonial growth of erythroid precursor cells were developed and employed in studies on regulatory effects of erythropoietin on cell differentiation. With Mr. Eric A. White (P&S '74), an *in vitro* assay for erythropoietin, employing cultured precursor cells, was developed. Drs. Marks and Rifkind, with Dr. George M. Maniatis (Human Genetics and Development), investigated the types of RNA preferentially synthesized in erythroid precursor cells in response to stimulation by erythropoietin. With Dr. Pamela Malpoix, Visiting Scientist from Brussels, Drs. Marks and Rifkind studied the effects of the base analog, BU⁴R, on differentiating erythroblasts and developed evidence which distinguishes the proliferative and differentiation-inducing effects of erythropoietin. Drs. Marks and Rifkind, with Ms. Dinah S. Singer (Human Genetics and Development), studied induction of erythroid cell differentiation in cells transformed by the Friend Leukemia Virus complex.

Dr. John S. Kovach carried out four prospective randomized studies of the therapy of solid tumors at the Mayo Clinic, Rochester, Minnesota with Dr. Charle G. Moertel (Division of Oncology, Mayo Clinic). These will be continued at the Medical Center.

During the past year, the Leukemia-Lymphoma group under the direction of Dr. Bank continued its studies of various chemotherapeutic regimens in

patients with acute leukemia, lymphomas, and solid tumors. Over 60 patients were placed on protocols in controlled studies of Acute Leukemia Cooperative Group B, of which Presbyterian Hospital is a member.

Dr. Goodman and his colleagues continued studies in lipid metabolism. Vitamin A was studied by Drs. John E. Smith, Frank R. Smith, Yoshikazu Kanda, A. Krishna Mallia, and Yasutoshi Muto. Retinol-binding protein (RBP), the specific transport protein for vitamin A, was studied in humans and rats. Extensive information was obtained about protein-calorie malnutrition, in collaboration with colleagues in Egypt, Guatemala, and Thailand. The effects of malabsorption on the plasma retinol transport system were studied in adult patients by Dr. F. R. Smith, with Dr. Lindenbaum. A bioassay of several analogues of vitamin A was conducted by Dr. J. E. Smith, to complement organ and tissue culture studies carried out with these compounds by Dr. Goodman in England. The work in lipid metabolism comprises part of the program of the Center for Prevention of Premature Arteriosclerosis at the Columbia-Presbyterian Medical Center. Clinical and metabolic studies dealing with various aspects of hyperlipidemia, arteriosclerosis, and coronary heart disease are in progress. Long-term studies to characterize cholesterol turnover in patients with hyperlipidemia are being conducted by Drs. F. R. Smith and Goodman, with Drs. Robert P. Noble and Ralph B. Dell (Pediatrics).

Dr. Roger L. Lerner continued studies of the regulation of insulin secretion in man, using secretin, glucagon, and tolbutamide.

Mr. Robert J. McConnell (P&S '73) and Drs. Carlos E. Menendez, Robert I. Henkin (N.I.H.), and Richard S. Rivlin demonstrated that defects in taste and smell sensations are common, reversible features of clinical hypothyroidism. A volume on riboflavin in physiology and medicine by 11 contributors was edited by Dr. Rivlin for publication in the Spring of 1974.

Drs. Abbie I. Knowlton with Beatrice C. Seegal (Microbiology) initiated studies to identify prostaglandins and renin by immunochemical techniques and to study variations from normal which may be encountered in experimental hypertensive states in rats.

Dr. Sidney C. Werner, with Dr. Ildiko Radichevich and Mr. Guillermo A. Acebedo, developed a rapid, reliable radioimmunoassay for both thyroxine (T⁴) and triiodothyronine (T³) in the same sample. With Drs. Butler and Harvey M. Rubenstein, Dr. Werner established that the T³ concentration in normal people of ages 5-93 decreases progressively with aging.

Dr. Osserman and his associates continued clinical and immunochemical investigations of multiple myeloma and related plasma cell dyscrasias. Dr. Takashi Isobe analyzed serum and urinary protein abnormalities in 100 cases of amyloidosis. A new system for classifying patients with generalized amyloidosis was developed. Using this system, it was concluded that most patients with Pattern I amyloidosis, either exclusively or in combination with Pattern II, have an underlying plasma cell dyscrasia. Drs. Osserman and Isobe also extended studies of the protein abnormalities in a newly defined variant of plasma cell dyscrasia designated "deleted H and L chain disease."

Dr. Jane H. Morse continued studies initiated with Mr. Robert J. Mascitelli (P&S '73) to purify and characterize immunochemically a dialyzable immunosuppressive peptide found in normal serum and elevated in certain pathological states which inhibits antibody synthesis, homograft rejection, and lymphocyte transformation. With Dr. Canfield, the immunosuppressive properties of human chorionic gonadotropin are being analyzed to ascertain whether this activity resides with its alpha or beta subunits.

Dr. Neu studied the *in vitro* activities of a number of new cephalosporin antibiotics and the role that Beta lactamases play in resistance of enteric organisms to such agents. With Elaine P. Winshell, Dr. Neu investigated the mechanisms of resistance of *Serratia marcescens* to antibacterial agents with special reference to the role of cell wall lipid. With Dr. Glenda J. Garvey, he investigated the human pharmacology and *in vitro* activity of ticarcillin, a semi-synthetic penicillin active against *Pseudomonas*. With Dr. Charles E. Cherubin (New York Medical College), Dr. Neu reviewed the epidemiology of *Salmonella* septicemia in New York City for the past 10 years and examined the resistance of human and animal *Salmonella* isolates from the Eastern United States.

Dr. Canfield continued to study the chemistry of human chorionic gonadotropin. The amino acid sequences of both of the hormone's subunits were determined with Drs. Francis J. Morgan and Steven Birken. In addition, studies of the localization of a radioactive hormone derivative showed that these subunits remain joined when they act in target tissues. Drs. Canfield and Morgan also participated in a collaborative study, now nearly complete, of the primary structure of human thyroxine binding prealbumin with Drs. Kanda and Goodman. When the results are combined with X-ray crystallographic data obtained by Dr. Colin C. F. Blake (Oxford, England), it will be possible to define the precise molecular mechanism by which this protein binds

thyroxine in human plasma. Drs. Canfield and Elizabeth J. Harfenist are also participating with Drs. Hymie L. Nessel and Butler in the Program Project Grant on thrombosis. During the past year several fragments of the clot-forming protein fibrinogen were purified for use in studies of its metabolism in thrombotic disease states. Dr. Canfield also studied new forms of therapy for patients with Paget's disease of bone. It was shown that a form of diphosphonic acid produces improvement, as judged by laboratory tests and symptom relief.

Dr. John N. Loeb continued studies on the effects of glucocorticoid hormones on cell proliferation in a variety of nonlymphoid tissues of the weanling rat. He found that DNA synthesis associated with new cell accretion (and hence with tissue growth) is quite specifically suppressible by small doses of cortisone, whereas DNA synthesis which instead reflects cell renewal is considerably more resistant to suppression. His observation that in contrast, *large* doses of hormone result in a marked suppression of gastric but not jejunal mucosal DNA synthesis suggests that the well-known phenomenon of glucocorticoid-induced gastric ulceration in the rat may at least in part be due to a suppression of normal mucosal turnover.

Dr. Bradley continued studies of the permeability of the hepatobiliary outflow tract. Dr. Reinhard G. Herz, Fellow of the Swiss National Foundation for Scientific Research, and Dr. Bradley found that sodium ferrocyanide clearance is markedly increased during cholestatic hepatitis due to ethinyl estradiol. Bile acids and other cholegogues were found by Dr. Morris, Mrs. Katherine J. Baker, and Dr. Bradley to increase the output of plasma protein and secretory IgA in dog bile whereas stasis under pressure was observed to prevent protein escape. Drs. Bradley and Jaime B. Coelho progressed in their investigation of nephron dimension and single nephron glomerular filtration role (SNGFR) in hypothyroid rats, showing that continued glomerular growth in the face of proximal tubular atrophy is associated with intrarenal vasoconstriction that reduces SNGFR commensurate with proximal tubular capability.

In 1973, the Program Project for Studies on Thrombosis was established involving Drs. Nessel, Canfield, Butler, and George D. Wilner (Pathology). During the year, fibrinopeptide A levels measured by radioimmunoassay were found to be grossly elevated in patients with acute and subacute intravascular coagulation and in patients with thrombosis and pulmonary embolism, including some in whom all other coagulation tests were normal. The measurement of

the A peptide promises to provide a sensitive quantitative index of coagulation and thrombosis *in vivo*. Dr. Ian M. Yudelman is involved in clinical aspects of this study. Dr. Greer Qureshi developed a radioimmunoassay for the NH₂-terminal disulfide knot of fibrinogen and Dr. Sophie B. Bilezikian is studying the cleavage kinetics of the A and B peptides from fibrinogen by various enzymes.

Drs. M. Irené Ferrer and Marianne J. Legato (Roosevelt) are continuing experiments on perfused cardiac muscle in which blood gases are manipulated. Dr. Ferrer has been utilizing a new electrocardiographic analysis computer program at the Medical Center whose usefulness is increasingly evident. Drs. Ferrer and Ray Bonner (I.B.M.) are collaborating in writing a computer program for comparative electrocardiographic reading.

Dr. Marshall P. Primack with Dr. Tapley continued studies on the mechanisms of thyroid hormone stimulation of mitochondrial protein synthesis.

Dr. Hylan A. Bickerman with Drs. Edith B. Reilly and John M. Rodgers is studying nasal airway resistance in patients with rhinitis of various types.

Dr. Laragh and his group continued to study hormones and sodium and potassium metabolism and their role in regulating arterial blood pressure and fluid balance in patients with high blood pressure or congestive heart failure. Ms. Jean E. Sealey and Drs. Leslie P. Baer, Hans R. Brunner, Ginette B. Jacob, Haralambos P. Gavras, Irene Gavras and Julio E. Sotelo continue as full-time members of the group. Dr. E. Darracott Vaughan, Jr., returned to the University of Virginia as an Assistant Professor of Urology, and Dr. Fritz R. Bühler went to Basel, Switzerland, as Chief of the Hypertension Unit at the University. Two visiting research fellows joined the group—Dr. Hans-Jorg Keim from Mainz, Germany and Dr. Herbert Thurston from Manchester, England. This professional group constitutes the “core” of the Hypertension Center, funded by the National Heart and Lung Institute. The Center has been structured to include other groups and disciplines. Among them are Drs. Paul J. Cannon and Donald H. Schmidt, Sadek Hilal and William J. Casarella (Radiology), Stephen Wotman (Dentistry), Harold F. Spalter (Ophthalmology), John C. M. Brust, Jr. (Neurology), Morton Levitt (Psychiatry), and Shu Chien (Physiology). Descriptions and instructional films were completed setting forth in detail the methods used by the Center for measuring plasma renin and plasma and urinary aldosterone. Two experimental studies were published which define and quantify two pressor mechanisms—renin and volume—in experimental renal hypertension; in man,

these pressor mechanisms were also characterized. A study of the kinetics of renin secretion in essential hypertension provided a basis for more precise diagnostic evaluation of patients suspected of renovascular hypertension. Another completed study indicated that low renin hypertensive patients have less renal damage, a finding supporting the group's earlier report that these patients are at less risk of heart attack or stroke. Other studies were completed which characterize the dual control of aldosterone secretion in man by angiotensin and potassium. Therapeutic studies of the past year further validate the approach of “hormonal profiling” with a renin-sodium index. Low renin patients were effectively treated by volume depletion with thiazides or aldosterone antagonists. In contrast, antirenin therapy with propranolol proved strikingly effective in high-renin and some normal-renin hypertensive patients.

Epidemiologic studies of adolescent hypertension (based on data from 3,537 high school students) were completed by Dr. Margaret H. Kilcoyne; the results indicate a greater prevalence of hypertension in this age group than previously reported, particularly in the young Black male. This work was done with Dr. Peggy A. Alsup (Neurology). The development of hypertension in a small group of adolescents could not be assigned a specific cause, implying early emergence of essential hypertension.

Dr. Cannon continued to investigate the regional circulations in patients with cardiovascular disease. Studies of the renal, myocardial, and cerebral circulations were undertaken. With Dr. Dell (Pediatrics) and Mr. Robert R. Sciacca, a computer program to perform nonlinear regression analysis of ¹³³xenon renal washout curves was developed. A study with Drs. Kilcoyne and Schmidt of intrarenal blood flow in patients with congestive heart failure indicated that preferential vasoconstriction of the renal cortex may accompany edema formation in patients with heart failure. Intrarenal blood flow in the hypertension and renal failure of progressive systemic sclerosis (scleroderma) was studied with Drs. David B. Case, Mohamed Hassar, Casarella (Radiology), and LeRoy. A high incidence of proteinuria, azotemia, and hypertension in patients with scleroderma was documented in 210 patients seen at this institution over a 20-year period. The three renal markers had an adverse effect upon prognosis in the disorder, and renal involvement was the leading cause of death. Studies of the renal circulation with ¹³³xenon and magnification arteriography in patients with scleroderma indicated that functional vasoconstriction in the renal cortex with specific lesions in the cortical interlobular arteries produce the renal manifestations

of the disease. Renal Raynaud's phenomenon was also demonstrated. Various therapeutic modalities including nephrectomy and dialysis were attempted, and renal transplantation was successfully performed in one patient with scleroderma and renal failure.

A team composed of Drs. Schmidt, Melvin B. Weiss, Cannon, and Cassarella and Kent Ellis (Radiology) continued to study regional myocardial blood flow in patients with coronary atherosclerosis. Dr. Weiss accumulated data which indicate that myocardial perfusion is significantly reduced below normal in patients with heart failure due to cardiomyopathy. Preliminary studies would suggest that reduced myocardial perfusion may be determined by alterations in myocardial contractility and wall stress. Dr. Casarella (Radiology) obtained data indicating that in patients with significant arteriographic disease of two or more branches of the left coronary artery, left ventricular myocardial perfusion rates are reduced. In patients with minor degrees of arterial obstruction, the blood flow rates were normal. Because resting myocardial perfusion rates were not subnormal in many patients with 60–70 per cent stenoses of coronary arteries and in regions distal to coronary obstructions that were well supplied by collateral vessels, Dr. Schmidt undertook a study of the effect of right atrial pacing (which increases myocardial oxygen consumption) on regional myocardial perfusion.

Dr. Frantz continued studies of anterior and posterior pituitary function, with major emphasis on prolactin. With Drs. Han K. Suh and Gordon L. Noel (Walter Reed) he studied prolactin responses in normal subjects and those with pituitary tumors to physiological and pharmacologic stimuli, including chlorpromazine, thyrotropin-releasing hormone, and L-dopa. Plasma prolactin was found to be the most commonly hypersecreted of all hormones in patients with pituitary tumors, and its measurement is therefore of considerable diagnostic value in differentiating tumor from other causes of pituitary dysfunction. With Drs. Earl A. Zimmerman (Neurology) and Richard F. Defendini (Pathology), Dr. Frantz correlated levels of plasma growth hormone and prolactin with the histological appearance of 21 surgically removed pituitary tumors studied by the highly specific immunoperoxidase technique. The values for secretory activity obtained with these techniques were highly correlated, and evidence was obtained for production of both growth hormone and prolactin by the same cell in normal pituitaries. Dr. Jon F. Sassin (Montefiore Hospital) continued to collaborate with Dr. Frantz on studies of hormone secretion throughout 24-hour periods; the pronounced night-

time peak of prolactin secretion proved wholly sleep-associated. A functioning radioimmunoassay for vasopressin was used by Dr. M. Kazim Husain in Dr. Frantz's laboratory to study the regulation of this hormone in animals as well as in humans. The presence of vasopressin as well as its carrier protein neurophysin was shown in the supraoptic and paraventricular nuclei of the monkey and bovine hypothalamus in studies with Drs. Zimmerman and Alan G. Robinson (University of Pittsburgh). In addition, these workers, with Drs. Peter W. Carmel (Neurological Surgery) and Michel J. Ferin (Obstetrics and Gynecology) showed exceedingly high levels of vasopressin (11,000 pg/ml) as well as neurophysin in blood aspirated by microcannulas from the hypophyseal portal vessels of anesthetized monkeys.

Drs. Butler and Schmidt studied the effects of antidigoxin antibodies and their Fab fragments on serum and urinary digoxin concentrations in dogs. Their finding that Fab fragments not only bind digoxin *in vivo* but also are rapidly excreted in the urine in complex with digoxin suggests that these fragments may be useful as a specific antagonist for this glycoside in severe digoxin intoxication in man. Drs. Stephanie P. April, Schmidt, and Butler are studying the mechanism by which specific antibodies reverse certain effects of digoxin on guinea pig myocardial tissue. Dr. Lindenbaum, Dr. Jacek J. Preibisz, Visiting Research Fellow of the World Health Organization, and Dr. Butler completed a study of variability in the biologic availability of digoxin tablets prepared by different manufacturers. With Drs. Ronald M. Cresswell and James E. Murphy (Burroughs Wellcome Company), Drs. Lindenbaum and Butler found a good correlation between the bioavailability of digoxin tablets as studied in human subjects and the dissolution rate of these tablets as studied in the laboratory, suggesting that dissolution rate testing may serve as a useful means of detecting unsatisfactory digoxin tablets.

Dr. Weinstein and his research group continued studies on the molecular and cellular events underlying chemical carcinogenesis. With Dr. Dezider Grunberger (Biochemistry) additional evidence was obtained that carcinogens bind to cellular nucleic acids, producing profound changes in nucleic acid structure and function. With Drs. Grunberger and Koji Nakanishi (Chemistry) the structure of an unusual component of mammalian transfer RNA, "peroxy-Y," was elucidated.

Drs. Joseph G. Sweeting and Charles A. Flood continued studies on colitis of various types.

Drs. Elsa-Grace Giardina, James A. Reiffel, and Bigger, devised analytical techniques for characteriz-

ing the behavior of the ventricular arrhythmic sites which produce premature ventricular depolarizations. Having discovered that procaine amide is metabolized by the liver, Drs. Giardina and Bigger are collaborating with Drs. Jaques Dreyfuss and Eric Schreiber (Squibb Institute for Medical Research) to characterize this drug's metabolism. Drs. Ronald E. Drusin, Kung-Ming Jan (Physiology), Shu Chien (Physiology), and Bigger are correlating the changes in hemorheology with hemodynamic patterns encountered in acute myocardial infarction: The patient's blood viscosity on admission accurately predicts his subsequent clinical course, regardless of admission clinical status.

The Arrhythmia Control Center, which is devoted to the detection, understanding, and control of human arrhythmias, is currently carrying out a double-blind study to determine whether propranolol is effective in arrhythmia prophylaxis. The study is conducted by three subgroups of the Center—the Clinical Group, including Dr. Robert H. Heissenbittel, Director, Drs. Drusin, William P. Lovejoy, Daniel L. Macken, Reiffel, Richard J. Stock, and Francis M. Weld; the Data Processing Group, headed by Dr. Bigger; and the Clinical Pharmacology Group, headed by Dr. Giardina. Drs. Reiffel, Bigger, and Giardina are conducting studies using two methods to evaluate human sinus node function: (1) sinus escape time after discontinuing rapid atrial pacing and (2) programmed premature atrial stimulation.

Dr. Schmidt developed a new computer-assisted method for rapid analysis of cardiac catheterization data.

Dr. John L. Roglieri is analyzing the determinants of patient utilization of the emergency room as a sole or major source of ambulatory care and the implications of that practice in the interaction between Vanderbilt Clinic and the community, as well as among the component clinics of Vanderbilt Clinic. Costs and benefits of deployment of nurse-practitioners in triage and extended primary care roles are being assessed.

Affiliations

Mary Imogene Bassett Hospital

Dr. Joseph S. Lunn was Acting Physician-in-Chief while a committee searched for a replacement for Dr. Malcolm I. Page, who resigned in 1972.

Harlem Hospital

Dr. Harold S. Ballard serves on an N.I.H. committee. Dr. Charles P. Felton was appointed Chief of the Chest Division. Dr. Roger J. Lewis joined the service as Chief of the Division of Infectious Dis-

eases. Dr. Gerald E. Thomson served as President of the New York Nephrology Society and was appointed to the Health Research Council of the City of New York. Dr. Lee B. Reichman was appointed Assistant Commissioner of Health for Environmental Health Services of the City of New York.

Roosevelt Hospital

Drs. Harvey J. Weiss and Marianne J. Legato serve on N.I.H. committees. Dr. Nicholas P. Christy is involved in formulating the self-assessment examination of the American College of Physicians and is a consultant to the Bureau of Drugs, H.E.W.

An alternative simpler and gentler method for isolating serum lipoproteins utilizing electrophoresis on agarose gel was developed by Dr. Gerald B. Phillips. Studies were carried out to further characterize a novel dense prebeta-lipoprotein which was described in this laboratory and the prealpha-lipoprotein of human serum using the agarose gel electrophoresis technique.

In the laboratory of Dr. Michael H. Grieco, circulating B and T lymphocytes are under study in patients with infectious and hypersensitivity diseases to evaluate the effect of disease and therapeutic agents. The initial studies in tuberculosis suggest that rifampin depresses circulating T lymphocytes.

Dr. Weiss demonstrated with Dr. Thomas B. Tschopp a defect in the adhesion of platelets to the subendothelium in patients with von Willebrand's disease. Dr. Weiss developed a quantitative assay for the plasma factor necessary for normal platelet function and missing in von Willebrand's disease (von Willebrand factor). Dr. Weiss showed that the procoagulant activity (antihemophilic factor) could be dissociated by high salt concentration from the activity of the von Willebrand factor. He showed with Dr. Anthony L. Willis (Hoffman-La Roche) that platelets of patients with storage pool disease do not synthesize prostaglandins normally, providing further evidence that prostaglandins play an important role in the platelet release reaction.

Dr. William Rosner completed studies on purified human testosterone-estradiol-binding globulin, and on improving the stability of affinity columns, and a new method for attaching ligands to solid supports was developed.

Dr. Joyce C. Shaver, with Drs. LeClair Bissell, Sujata P. Roy, and Christy, challenged current "therapeutic" usage of adrenocortical steroids in long-abstinent alcoholics. Their studies of adrenal function in rehabilitated chronic alcoholic males demonstrated that major indices of adrenocortical function are normal in alcoholic subjects who have

been abstinent for two years or longer.

Dr. Legato investigated the mechanism of sarcomerogenesis and mitochondrial reproduction in the mammalian myocardial cell; ultrastructural characteristics of diseased human myocardium, and of the rat ventricular cell grown in tissue culture; effects of hypoxia, hypercapnea, and pH shifts on mammalian myocardial cell function, and of calcium flux on ultrastructural characteristics; and function of the transverse tubular system in the mammalian cell.

Dr. Christy continued studies of the abnormal adrenocorticotropin of Cushing's syndrome, and the metabolism of estrogens in liver disease.

Dr. Richard P. Ames is collaborating with Dr. Peter Hill (American Health Foundation) to study the effect of submaximal exercise on blood pressure and plasma renin activity in normal, obese, and hypertensive individuals.

Dr. Edward M. Dwyer, Jr. studied the effects of nitroglycerine on determinants of oxygen consumption in the left ventricle in man.

St. Luke's Hospital

Dr. F. Xavier Pi-Sunyer was elected Chairman of the Clinical Society of the New York Diabetes Association. Drs. John F. Bertles and Robert B. Case serve on N.I.H. committees; Dr. Bertles ended his term as President of the New York Society for the Study of Blood. Dr. Peter R. Holt is Chairman of the Research Committee of the American Gastroenterological Association. Dr. Theodore B. Van Itallie is Vice-Chairman of the Council on Foods and Nutrition of the A.M.A.

Dr. S. Bennett Clark with Professor K. R. Norum (University of Oslo) is investigating the role of triglyceride absorption in chylomicron cholesterol homeostasis. The kinetics of transmucosal fat transport in different regions of intestine is presently being examined in rats by Ms. Hi-Lien Wu and Dr. Holt. Dr. Holt, with members of the Columbia School of Bioengineering, is examining the factors responsible for intestinal triglyceride emulsification; it was shown that the mechanics of the pylorus of the stomach appear inadequate to provide the energy needed for emulsification.

Members of the Gastrointestinal Division under the direction of Dr. Richard S. McCray evaluated a new duodenoscope capable of both forward and lateral viewing and found that lateral viewing is necessary to visualize 18 per cent of duodenal ulcers. With Dr. Robert H. Herman (U. S. Army Medical Research and Nutrition Laboratory, Denver) Dr. Norton S. Rosensweig continued studies of the adaptive response of intestinal enzymes to dietary sugars.

Drs. Case, Henry M. Greenberg (Roosevelt), and Robert S. Moskowitz studied the possible role of CO₂ as the major factor controlling autoregulation of coronary blood flow in response to alterations in myocardial O₂ consumption.

Dr. Bertles is working on an animal model for synthesis of fetal hemoglobin in certain hematologic diseases of man. With Dr. Max F. Perutz (Medical Research Council, Cambridge, England), a structural schema of the fibrous aggregate of deoxygenated molecules of sickle-cell hemoglobin responsible for sickling was proposed. With Drs. Beatrice Magdoff-Fairchild and Paul H. Swerdlow, and in collaboration with Dr. Shu Chien (Physiology), work continues on the pathophysiology of hemoglobin interactions inside human red blood cells.

Drs. Sami A. Hashim and Phenvit Tantibhedyangkul continued to study the metabolism and clinical use of medium chain fatty acids and triglycerides. Dr. Pi-Sunyer with Dr. S. Wood (Psychology) showed in rats that modification of the leucine molecule by addition of an amide group, a methyl or ethyl ester eliminated the ability to elicit insulin secretion and that only the L-isomer of leucine is effective.

Dr. Robert S. Bernstein has been studying the relationship of hexokinase isoenzymes to insulin sensitivity in adipose tissue incubated *in vitro*. He demonstrated that glucose is necessary for the insulin-induced increase in hexokinase type II, and that dexamethasone decreases the enzyme independent of changes in early glucose uptake.

Dr. Paul Cushman has been studying the endocrinological consequences of narcotic addiction.

Acknowledgments

The Department would find it difficult to continue functioning were it not for the generous contributions of many donors. Not all the names can be mentioned, but the Department is grateful to all. The list of donors during 1973 includes: Mrs. Harriet W. Ackley; Louis and Bessie Adler Foundation, Inc.; The Alma Toorock Memorial for Cancer Research, Inc.; American Cancer Society, Inc.; American Heart Association, Inc.; The Arthritis Foundation, Inc., New York Chapter; Mr. Reginald Auchincloss; Beecham-Massengill Pharmaceuticals; Mr. T. Roland Berner; Bezalel Foundation, Inc.; Boehringer Ingelheim Ltd.; Mr. Max Borden; Stanley E. Bradley, M.D.; Bristol Laboratories; Bristol-Myers Production Corporation; Burroughs Wellcome Company; George A. Carden, Jr., M.D.; Chernow Foundation, Inc.; Mr. and Mrs. Michael Chernow; Cooley's Anemia Blood & Research Found-

dation for Children, Inc.; Mr. Edouard Courmand; Mr. Paul L. Davies; Arthur K. Delson Medical Research Fund; Dow Chemical Company; May L. Elling, deceased; Mrs. Webb A. Everett; Mrs. Phyllis R. Farley; The Fisher Brothers; Mr. J. Robert Fisher; Shirley C. Fisk, M.D.; The Fleitas Foundation; Dr. and Mrs. John Forline; Andrew Gibson Frantz, M.D.; General Mills Foundation; Mrs. Louis Goldberg; Stella and Charles Guttman Foundation; Mary W. Harriman Trust Deed; The William Randolph Hearst Foundation; Heart and Lung Foundation; Mr. Lawrence C. Hoff; Hoffman-LaRoche Foundation; Mr. J. Hohenstein; Mr. Stanley J. Holuba; Mr. and Mrs. Herbert Irving; Mrs. Irving D. Karpas; Mr. and Mrs. Justus B. Lawrance; Mr. James Lehrer; Mr. and Mrs. Albert Levy; The Charlotte and Sidney Lifschultz Foundation; The Joe & Emily Lowe Foundation, Inc.; Virginia & D. K. Ludwig Foundation, Inc.; Lupus Erythematosus Foundation, Inc.; Josephine H. McIntosh Foundation, Inc.; Mr. P. R. Mallory; James Hilton Manning & Emma Austin Manning Foundation; Merrel National Laboratories; Monet; Morris Morgenstern Foundation; National Fund for Medical Education; New York Heart Association, Inc.; Parke-Davis Company; Mrs. Charles C. Paterson, Henry B. Plant Memorial Fund, Inc.; The Pezrow-Geist Foundation; Pfizer, Inc.; The John Polachek Foundation; Mrs. Arthur W. Pope; Population Council, Inc.; Presbyterian Hospital Alumni Association; Procter & Gamble Company; Dr. Richard R. Prouty; Mr. Otto

B. Reimer; Fannie E. Rippel Foundation; The Ritter Foundation, Inc.; Schering Corporation; The William Lightfoot Schultz Foundation; Mr. Frederick Schwarz; Dr. John Scudder; Mrs. Howard F. (Elizabeth) Shattuck; Shelter Rock Foundation; Mr. and Mrs. Carl Shirley; Smith Kline & French Laboratories; E. R. Squibb & Sons, Inc.; Mr. Oliver J. Sterling; Stony Wold; The Frank Strick Foundation; Mr. Joseph A. Thomas; The Upjohn Company; The Wappler Foundation, Inc.; Estate of Irma T. Hirsch; Mrs. Dorothy A. Yasuna; and Miss Harriet M. Young, deceased.

Many gifts were received in tribute to past members and friends of the Department and the Medical Service. Among these were gifts in memory of: Professor Julia M. Jones from Dr. Harry Golembe; Dr. Yale Kneeland from Mr. Winslow Carlton; Dr. Robert F. Loeb, Emeritus Professor, from Mr. and Mrs. John F. Bush, Jr., Bertran J. Sanger, M.D. and Bernard Schoenberg, M.D.; Professor Dickinson W. Richards, from Mr. and Mrs. Edgar P. Baker, Mr. and Mrs. W. L. Marshall, Jr., Merck Sharp & Dohme, Francis S. North Foundation, Dr. Richard L. Riley.

Gift were also received from their friends and relatives in memory of Loretta Austin; Gerald N. Campe; Catherine Chesney, R. N.; Carmen Franz; Sidney Goldberg; Rhoda Gordon; Mrs. Beverly Gruber; Howard Henig; Henry S. Reeder; Julianne Humphrey Schager; Margery Scull; Sol O. Snyder; Robert Stephan and the parents of Dr. Arthur Wertheim.

1973 Publications

Medicine

Abramson, H.; Bertles, J. F. and Wethers, D. L., Editors
Sickle Cell Disease. C. V. Mosby, St. Louis, Mo., 1973.

Arnsdorf, M. F. and Bigger, J. T., Jr.
The effect of lidocaine hydrochloride on membrane conductance in mammalian cardiac Purkinje fibers.
J. Clin. Invest. **51**:2252-2263, 1972.

Ballard, H. S. and Marcus, A. J.
Primary and secondary platelet aggregation in uremia.
Scandinav. J. Haemat. **9**:198-203, 1972.

Bank, A.; Dow, L. W.; Farace, M. G.; O'Donnel, J. V.; Ford S. and Natta, C. L.
Changes in globin synthesis with erythroid cell maturation in sickle-thalassemia. *Blood* **41**:353-357, 1973.

Bank, A. and Marks, P. A.
The thalassemia syndromes and the intracellular regulation of globin synthesis. *Med. Clin. North America* **57**:303-313, 1973.

Barach, A. L.; Bickerman, H. A. and Rodgers, J. M.
Continuous positive pressure breathing in chronic obstructive lung disease. Effect on minute ventilation and blood gases. *Ann. Allergy*. **31**:72-78, 1973.

Bennett Clark, S.; Ekkers, T. E.; Singh, A.; Balint, J. A.; Holt, P. R. and Rodgers Jr., J. B.
Fat absorption is essential fatty acid deficiency: A model experimental approach to studies of the mechanism of fat malabsorption of unknown etiology.
J. Lipid Res. **14**:581, 1973.

Bennett Clark, S.; Lawergren, B. and Martin, J. V.
Regional intestinal absorptive capacities for triolein; An alternative to markers. *Am. J. Physiol.* **225**:574-585, 1973.

Berkowitz, J. S.; David, D. S.; Sakai, S.; Shoji, H.; Cheigh, J. S.; Riggio, R. R.; Stenzel, K. H. and Rubin, A. L.
Ocular complications in renal transplant recipients. *Am. J. Med.* **55**:492, 1973.

- Bertles, J. F.
Multiple hemoglobins in cells: Significance and genetic control. In *Sickle Cell Disease*. H. Abramson, J. F. Bertles and D. L. Wethers, eds. C. V. Mosby, St. Louis, Mo., 1973.
- Bickerman, H. A.
What's a practical approach to the A-B-E-Complex? In: *Essays in Medicine: Chronic Obstructive Pulmonary Disease*. J. H. McClement, ed. MedCom., New York, 1973, pp. 33-35.
- Bigger, J. T., Jr.
Antiarrhythmic drugs in ischemic heart disease. *Hosp. Practice* 7:69-80, 1972.
Mechanisms of digitalis toxic arrhythmias and the clinical recognition of digitalis toxicity. In: *Controversies in Clinical Pharmacology and Drug Development*. R. F. Palmer, ed. Futura Publishing Co., Inc., Mount Kisco, N.Y., 1972, pp. 125-135.
Arrhythmias and antiarrhythmic drugs. *Advances Internal Med.* 18:251-281, 1973.
Electrical properties of cardiac muscle and possible causes of cardiac arrhythmias. In: *Cardiovascular Arrhythmias*. L. S. Dreifus and W. Likoff, eds. Grune & Stratton, New York, 1973, pp. 13-34.
- Bigger, J. T., Jr., and Giardina, E. G. V.
The pharmacology and clinical use of lidocaine and procaine amide. *Med. Coll. Virginia Quart.* 9:67-78, 1973.
- Bigger, J. T., Jr., and Strauss, H. C.
The evaluation of sinoatrial node function in man. *Med. Coll. Virginia Quart.* 9:79-87, 1973.
Digitalis toxicity: Drug interactions promoting toxicity and the management of toxicity. *Seminars Drug Treatment* 2:147-177, 1972.
- Blobstein, S.; Grunberger, D.; Weinstein, I. B. and Nakanishi, K.
Isolation and structure determination of the fluorescent base from bovine liver phenylalanine transfer ribonucleic acid. *Biochemistry* 12:188-192, 1973.
- Bonner, R. E.; Crevasse, L.; Ferrer, M. I. and Greenfield, J. C.
A new computer program for analysis of scalar electrocardiograms. *Computers and Biomed. Res.* 5:629, 1972.
- Boyer, S.; Scher, W.; Preisler, H.; Friend, S. and Bank, A.
Hemoglobin biosynthesis in murine virus induced cells *in vitro*. *Blood* 40:823-835, 1972.
- Bradley, S. E.
Studies of bromsulphalein storage with special reference to the problem of "storage debt." In: *The Liver, Quantitative Aspects of Structure and Formation*. Karger, Basel, 1973, pp. 133-138.
- Bradley, S. E.; Bradley, G. P. and Stephan, F.
Role of structural imbalance in the pathogenesis of renal dysfunction in the hypothyroid rat. *Trans. A. Am. Phys.* 85:344-352, 1972.
- Bradley, S. E. and Coelho, J. B.
Renal pharmacology of "shock" and its congeners. In: *Drugs affecting kidney function and metabolism*. Edwards, ed. *Progr. Biochem. Pharmacol.* 7:1-58 (Karger, Basel), 1972.
- Brodows, R. G.; Pi-Sunyer, F. X. and Campbell, R. G.
Neural control of counter-regulatory events during glucopenia in man. *J. Clin. Invest.* 52:1841-1844, 1973.
- Brunner, H. R.; Sealey, J. E. and Laragh, J. H.
Renin subgroups in essential hypertension: Further analysis of their pathophysiologic and epidemiologic characteristics. *Circ. Res.* 32 & 33 (Suppl. I): 99-109, 1973.
- Bühler, F. R. and Laragh, J. H.
Essentielle Hypertonie: Biochemische Analyse—gezielte Behandlung. *Schweiz. Rundschau Med. (Praxis)* 62:489-491, 1973.
- Bühler, F. R.; Laragh, J. H.; Baer, L.; Vaughan, E. D., Jr. and Brunner, H. R.
Propranolol inhibition of renin secretion. A specific approach to diagnosis and treatment of renin-dependent hypertensive diseases. *New England J. Med.* 287: 1209-1214, 1972.
- Bühler, F. R.; Laragh, J. H.; Sealey, J. E. and Brunner, H. R.
Plasma aldosterone-renin interrelationships in various forms of essential hypertension: Studies using a rapid assay of plasma aldosterone. *Am. J. Cardiol.* 32:554-561, 1973.
- Bühler, F. R.; Laragh, J. H.; Vaughan, E. D., Jr.; Brunner, H. R.; Gavras, H. and Baer, L.
The antihypertensive action of propranolol: Specific anti-renin responses in high and normal renin forms of essential, renal, renovascular and malignant hypertension. *Am. J. Cardiol.* 32:511-522, 1973.
- Butler, V. P., Jr.
Radioimmunoassay and competitive binding radioassay methods for the measurement of drugs. *Metabolism* 22:1145-1153, 1973.
- Butler, V. P., Jr. and Beiser, S. M.
Antibodies to small molecules: Biological and clinical applications. *Advances Immunol.* 17:255-310, 1973.
- Butler, V. P., Jr.; Watson, J. F.; Schmidt, D. H.; Gardner, J. D.; Mandel, W. J. and Skelton, C. L.
Reversal of the pharmacological and toxic effects of cardiac glycosides by specific antibodies. *Pharmacol. Rev.* 25:239-248, 1973.
- Caldwell, P. R. B. and Nagel, R. L.
The binding of 2, 3-diphosphoglycerate as a conformational probe of human hemoglobins. *J. Molec. Biol.* 74:605-611, 1973.
- Caldwell, P. R. B.; Nagel, R. L. and Jaffé, E. R.
The binding of 2, 3-diphosphoglycerate to human hemoglobin. In: *Preservation of Red Blood Cells*. National Academy of Sciences, Washington, D. C., 1973, pp. 173-178.
- Campbell, R. G.; Becker, E. E.; Hashim, S. A. and Van Itallie, T. B.
Food intake regulation in man: Fine-grained analysis of responses to variations in nutritive density. *Am. J. Clin. Nutrition* 26:459, 1973.

- Canfield, R. E.
Purification and biochemical characterization of human chorionic gonadotropin. In: *Methods in Investigative and Diagnostic Endocrinology*. S. A. Berson, ed. A.S.P. Biological & Medical Press, North-Holland Pub. Co., Amsterdam, 1973.
- Canfield, R. E.; Kammerman, S.; Kolena, J. and Channing, C. P.
Interactions of 125-I-hCG with its receptor sites. In: *Proceedings of the II International Symposium on Structure-Activity of Protein and Polypeptide Hormones (Part 2)*. M. Margoulies and F. C. Greenwood, eds. Excerpta Medica International Congress Series #241, Amsterdam, 1972, p. 510.
- Canfield, R. E.; Morgan, F. J.; Kammerman, S. and Ross, G. T.
Studies of the structure and recombination of the subunits of human chorionic gonadotropin. In: *Proceedings of the II International Symposium on Structure-Activity of Protein and Polypeptide Hormones (Part 2)*. M. Margoulis and F. C. Greenwood, eds. Excerpta Medica International Congress Series #241, Amsterdam, 1972, p. 341.
- Cannon, P. J.
Etudes du débit sanguin regional du myocarde chez l'homme avec le xenon 133 et une camera a scintillations a cristaux multiples. In: *14th Colloque de Médecine Nucléaire de Langue Française*, Vol. II. Tours, France, June, 1972, p. 250-259.
- Diuretic therapy in patients with renal disease. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little Brown & Co., Boston, 1973, pp. 499-522.
- Carey, J. P. and Turino, G. M.
Hereditary aspects of chronic obstructive pulmonary disease. *Postgrad. Med.* 54:64-70, 1973.
- Case, R. B.
Ion alterations during myocardial ischemia. *Cardiology* 56:245-262, 1972.
- Myocardial potassium loss during ischemia. In: *Myocardiology. Vol. I: Recent Advances in Studies on Cardiac Structure and Metabolism*. E. Bajusz and G. Rona, eds. University Park Press, Baltimore, 1972.
- Case, R. B.; Gunther, S. J. and Cannon, P. J.
Ethacrynate-induced depression of respiration in transport systems and kidney mitochondria. *Am. J. Physiol.* 224:769-780, 1973.
- Christy, N. P.
Editorial: The clinical significance of pituitary-adrenal suppression by exogenous corticosteroids. *J. Chron. Dis.* 26:261-264, 1973.
- Radioimmunoassay of human plasma ACTH and the pathogenesis of Cushing's disease. (Commemorative issue in honor of S. A. Berson, D. T. Krieger, ed.) *Mt. Sinai J. Med.* 40:298-301, 1973.
- Christy, N. P.; Weiss, H. J.; Phillips, L. L.; Phillips, G. B. and Hopewell, W.
Exotic snakebite in an urban setting: Heparin therapy of disseminated intravascular coagulation in a patient bitten by a saw-scaled viper (*Echis carinatus*). *Trans. Am. Clin. & Climatol. A.* 84:37, 1972.
- Coelho, J. B.; Chien, K-C. H. and Bradley, S. E.
Measurement of single-nephron glomerular filtration rate without micropuncture. *Am. J. Physiol.* 223:832-839, 1972.
- Cokkinos, D. V.; Leachman, R. D.; Zamalloa, O.; Cabrera, R. and Ferrer, M. I.
Influence of atrial mass on amplitude and duration of the P wave. *Chest* 61:336-339, 1972.
- Cournand, A. and Meyer, M.
Overcrowding, a disease of social growth. *Futures*, June, 1973, pp. 287-296.
- Cournand, A. F. and Lévy, M., Editors
Shaping the Future: Gaston Berger and the Concept of Prospective. Gordon and Breach, Ltd., Science Publishers, London and New York, 1973.
- Cushman, P.
Usher Parsons: Naval surgeons in the battle of Lake Erie. *New York J. Med.* 71:2894, 1971.
- Methadone maintenance therapy for heroin addiction: Some surgical considerations. *Am. J. Surg.* 123:267, 1972.
- Methadone maintenance treatment of narcotic addiction. Analysis of police records of arrests before and during treatment. *New York J. Med.* 72:1752, 1972.
- Growth hormone in narcotic addiction. *J. Clin. Endocrinol.* 35:352, 1972.
- Sexual behavior in heroin addiction and methadone maintenance. *New York J. Med.* 72:1721, 1972.
- Naval surgery in the War of 1812. *New York J. Med.* 72:1881, 1972.
- Addicts and methadone: A dilemma. Editorial, *Wall Street Journal*, Jan. 10, 1973.
- Persistent increased immunoglobulin M in treated narcotic addiction: Association with liver disease and continuing heroin use. *J. Allerg. & Clin. Immunol.* 56:122, 1973.
- Evaluation of a methadone maintenance program. *Hospitals (J. Am. Hosp. A.)* 47:67, 1973.
- Cushman, P. and David, D.
Stimulation of adrenal corticosteroid secretion by hypercalcemia in the dog. *Proc. Soc. Exper. Biol. & Med.* 139:709, 1972.
- Cushman, P. and Grieco, M.
Hyperimmunoglobulinemia associated with narcotic addiction: Effect of methadone maintenance treatment. *Am. J. Med.* 54:320, 1973.
- David, D. S.
Solving the low protein, low potassium, low sodium dilemma. In: *Enjoying Your Restricted Diet*. M. B. Salmon and A. E. Quigley, eds. Charles C. Thomas, Springfield, Ill., 1972, p. 159.
- Dietary treatment of renal failure. *Am. Heart J.* 86:1, 1973.
- David, D. S.; Sakai, S.; Brennan, B. L.; Riggio, R. R.; Cheigh, J.; Stenzel, K. H.; Rubin, A. L. and Sherwood, L. M.
Hypercalcemia following renal transplantation: Long term follow-up *New England J. Med.* 289:398, 1973.

- David, D. S.; Sakai, S.; Granda, J.; Cheigh, J. S.; Riggio, R. R.; Stenzel, K. H. and Rubin, A. L.
On the role of pyrophosphate in renal osteodystrophy. *Trans. Am. Soc. Artif. Internal Organs* 19, 1973.
- Dell, R. B.; Sciacca, R. Leiberman, K.; Case, D. B. and Cannon, P. J.
A weighted least-squares technique for the analysis of kinetic data and its application to the study of renal ¹³³xenon washout in dogs and man. *Circ. Res.* 32:71, 1973.
- Dow, L. W.; Terada, M.; Natta, C.; Metafore, S.; Grossbard, E.; Marks, P. A. and Bank, A.
A comparison of globin synthesis directed by intact cells and isolated mRNA in β thalassemia. *Nature* 243:114-116, 1973.
- Dreyfuss, J.; Bigger, J. T., Jr. and Schreiber, E. C.
Metabolism of procainamide in man and monkey and N-acetylprocainamide in the monkey. *Clin. Pharmacol. & Therap.* 13:366-371, 1972.
- Dwyer, E. M., Jr.; Dell, R. B. and Cannon, P. J.
Regional myocardial blood flow in patients with residual anterior and inferior transmural infarction. *Circulation* 48:924, 1973.
- Espinoza, J. and Rosensweig, N. S.
Effect of aging on the response of rat hepatic glycolytic enzyme activities to dietary sugars. *Am. J. Clin. Nutrition* 26:608, 1973.
- Estes, D.; Atra, E. and Peltier, A.
An immunofluorescent method for the detection of antigrammaglobulin antibodies. *Arthr. & Rheumat.* 16: 59-65, 1973.
- Falk, K.; Rayyes, A. N.; David, D. S.; Hochgelerent, E. L. and Sakai, S.
Myoglobinuria with reversible acute renal failure. *New York J. Med.* 73:537, 1973.
- Farace, M. G. and Bank A.
Control of human hemoglobin synthesis: Translation of globin chain in heterozygotes with hemoglobin Riverdale-Bronx. *Biochim. Biophys. Acta* 312:591-597, 1973.
- Farhangi, M. and Osserman, E. F.
Treatment of multiple myeloma. *Seminars Hemat.* 10: 149-161, 1973.
- Fenoglio, C.; Ferenczy, A.; Isobe, T. and Osserman, E. F.
Hepatoma associated with marked plasmacytosis and polyclonal hypergammaglobulinemia. *Am. J. Med.* 55:111-115, 1973.
- Ferrer, M. I.
Intraventricular conduction defects: New facts, new concepts, new problems. *Med. Times* 100:45, 1972.
The natural history of the sick sinus syndrome. *J. Chron. Dis.* 25:313, 1972.
Physiology of anomalous connections in pre-excitation. *Chest* 65:525, 1972.
The significance of axis deviation (Editorial). *Chest* 61:2, 1972.
Electrocardiographic Notebook, 4th ed. Futura Publishing Co., 1973.
The sick sinus syndrome. *Circulation* 47:635, 1973.
- Finch, J. T.; Perutz, M. F.; Bertles, J. F. and Dobler, J.
Structure of sickle erythrocytes and of sickle cell haemoglobin fibres. *Proc. Nat. Acad. Sc.* 70:718, 1973.
- Flood, C. A.
Relaxation of the cardia in achalasia. *Gastroint. Endoscopy* 18:114, 1972.
Palpation of the esophagus (Editorial). *Gastroint. Endoscopy* 19:36, 1972.
- Frantz, A. G.
Catecholamines and the control of prolactin secretion in humans. In: *Progress in Brain Research, Vol. 39. Drug Effects on Neuroendocrine Regulation*. E. Zimmerman, W. H. Gispen, B. H. Marks, and D. DeWied, eds. Elsevier, Amsterdam, 1973, pp. 311-321.
The regulation of prolactin secretion in humans. In: *Frontiers in Neuroendocrinology 1973*. L. L. Martini and F. Ganong, eds. Oxford University Press, New York, 1973, p. 337-374.
- Friedman, R. C.; Kornfeld, D. S. and Bigger, J. T., Jr.
Physiological problems associated with sleep deprivation in interns. *J. Med. Education* 48:436-441, 1973.
- Fritts, H. W., Jr.; Martinez, J.; Irwin, R. S.; Thomas, H. M. III and Wigle, R. D.
A canine model of granulomatous lung disease: Alterations in pulmonary structure. *Trans. Am. Clin. & Climatol. A.* 84:144-148, 1972.
- Fritts, H. W. and Rochester, D. F.
Respiratory stimulants and obstructed airways. Editorial. *New England J. Med.* 288:464-465, 1973.
- Fuhr, J. E. and Natta, C. L.
Translational control of alpha and beta globin synthesis. *Nature* 240:274, 1972.
- Futch, C.; Zikria, B. A. and Neu, H. C.
Bacteroides liver abscess. *Surgery* 73:59, 1973.
- Gardner, J. D.; Kiino, D. R.; Swartz, T. J. and Butler, V. P., Jr.
Effects of digoxin-specific antibodies on accumulation and binding of digoxin by human erythrocytes. *J. Clin. Invest.* 52:1820-1833, 1973.
- Garfein, O. B.; Buckley, M. J. and Kurland, G. S.
Postaortotomy mycotic pseudoaneurysm; a nonvalvular, potentially resectable source of intravascular sepsis following prosthetic valve surgery. *J. Am. Med. A.* 255:410-411, 1973.
- Garret, R. and Ames, R. P.
Black-pigmented adenoma of the adrenal gland. *Arch. Path.* 95:349-353, 1973.
- Gavras, H.; Brunner, H. R.; Vaughan, E. D., Jr. and Laragh, J. H.
Angiotensin-sodium interaction in blood pressure maintenance of renal hypertensive and normotensive rats. *Science* 180:1369-1371, 1973.
- Giardina, E. G. V.; Heissenbittel, R. H. and Bigger, J. T., Jr.
Intermittent intravenous procaine amide to treat ventricular arrhythmias: Correlation of plasma concentration with effect on arrhythmia, electrocardiogram, and blood pressure. *Ann. Int. Med.* 78:183-193, 1973.

- Goodman, DeW. S.
Vitamin A transport in human and rat plasma and its nutritional regulation. In: *Current Trends in the Biochemistry of Lipids, Biochemical Society Symposia: Number 35*. J. Ganguly and R. M. S. Smellie, eds. Academic Press, London and New York, 1972, pp. 287-293.
- Vitamin A transport in man and the rate. In: *Dietary Lipids and Postnatal Development*. C. Galli, G. Jacini, A. Pecile, eds. Raven Press, New York, 1973, pp. 157-164.
- Goodman, DeW. S.; Noble, R. P. and Dell, R. B.
Three-pool model of the long-term turnover of plasma cholesterol in man. *J. Lipids Res.* 14:178-188, 1973.
- The effects of colestipol resin and of colestipol plus clofibrate on the turnover of plasma cholesterol in man. *J. Clin. Invest.* 52:2646-2655, 1973.
- Greenberg, H.; Jameson, A. G.; Pinkernell, B. and Dwyer, E. M., Jr.
Effects of nitroglycerine on left ventricular myocardial blood flow and the major determinants of myocardial oxygen consumption. *Bull. New York Acad. Med.* 48:1042, 1972.
- Grieco, M. H.
Pseudomonas arthritis and osteomyelitis. *J. Bone & Joint Surg.* 54-A:1693-1704, 1972.
- Grieco, M. H. and Chuang, C. Y.
Hypermacroglobulinemia associated with heroin use in adolescents. *J. Allerg. & Clin. Immunol.* 51:152-160, 1973.
- Grieco, M. H.; McCray, R. S. and Nay, H. R.
Gentamicin therapy for liver abscesses due to *P. aeruginosa* and *S. marcescens*. *New York J. Med.* 73:1108-1110, 1973.
- Grossbard, E. G.; Terada, M.; Dow, L. W. and Bank, A.
Decreases in α mRNA activity associated with polyribosomes in α thalassemia. *Nature* 241:209-211, 1973.
- Harvey, R. M.
A positive approach to cor pulmonale. In: *Essays in Medicine: Chronic Obstructive Pulmonary Disease*. MedCom, New York, 1973.
- Henkin, R. I. and Smith, F. R.
Zinc and copper metabolism in acute viral hepatitis. *Am. J. Med. Sc.* 264:401-409, 1972.
- Hutchinson, J. E. III; Schmidt, D. H.; Cameron, A. and McCord, C. W.
The surgical management of intracardiac defects due to penetrating trauma. *J. Thorac. & Cardiovasc. Surg.* 65:103, 1973.
- Irwin, R. S. and Thomas, H. M. III
Mucoid impaction of the bronchus. *Am. Rev. Resp. Dis.* 108:955-959, 1973.
- Kacian, D. L.; Gambino, R.; Dow, L. W.; Grossbard, E.; Natta, C.; Ramirez, F.; Spiegelman, S.; Marks, P. A. and Bank, A.
Decreased globin messenger RNA in thalassemia detected by molecular hybridization. *Proc. Nat. Acad. Sc.* 70:1886-1890, 1973.
- Kennedy, W. R.; Johnston, A. D. and Becker, A.
Massive articular osteolysis and rheumatoid arthritis, treated by total hip replacement. *Clin. Orthop.* 90:161-173, 1973.
- Kilcoyne, M. M.
Hypertension and heart disease in the urban community. *Bull. New York Acad. Med.* 49:501-509, 1973.
- Kilcoyne, M. M.; Schmidt, D. H. and Cannon, P. J.
Intrarenal blood flow in congestive heart failure. *Circulation* 47:786-797, 1973.
- Kimberg, D. V. and Loeb, J. N.
Effects of cortisone administration on rat liver mitochondria: Support for the concept of mitochondrial fusion. *J. Cell Biol.* 55:635, 1972.
- Laragh, J. H.
Pathophysiology of edema. In: *The Body Fluids in Pediatrics*. R. Winters, ed. Little, Brown & Co., Boston, 1973, pp. 155-181.
- Potassium, angiotensin and the dual control of aldosterone secretion. (Editorial.) *New England J. Med.* 289:745-746, 1973.
- Vasoconstriction-volume analysis for understanding and treating hypertension: The use of renin and aldosterone profiles. *Am. J. Med.* 55:261-274, 1973.
- Laragh, J. H.; Sealey, J. E. and Brunner, H. R.
The control of aldosterone secretion in normal and hypertensive man: Abnormal renin-aldosterone patterns in low renin hypertension. *Am. J. Med.* 53:649-662, 1972.
- Humoral control of renal sodium excretion. Proc. International Symposium on Modern Diuretic Therapy, London, May 8-9, 1972. In: *Modern Diuretic Therapy in the Treatment of Cardiovascular and Renal Disease*. A. F. Lant and G. M. Wilson, eds. Excerpta Medica, Amsterdam, 1973, pp. 26-39.
- Legato, M. J.
Ultrastructure of the atrial, ventricular and purkinje cell, with special reference to the genesis of arrhythmias. *Circulation* 47:178, 1973.
- Book review of *Recent Advances in Studies on Cardiac Structure and Metabolism: Volume I, Myocardiology*. *Circulation* 47:207, 1973.
- The role of Z substance in sarcomerogenesis. *J. Molec. & Cell. Cardiol.* 5:16 5, 1973.
- The Myocardial Cell for the Clinical Cardiologist*. Futura Publishing Co., New York, 1973.
- LeRoy, E. C.
Connective tissue synthesis by scleroderma skin fibroblasts in cell culture. *J. Exper. Med.* 135:1351-1362, 1972.
- The clinical slide collection on the rheumatic diseases. *Bull. Rheumat. Dis.* 24:739, 1973.
- Discussion of case report: Richardson, J. A. Hemodialysis and kidney transplantation for renal failure from scleroderma. *Arthr. & Rheumat.* 16:270, 1973.
- Lindenbaum, J.
Bioavailability of digoxin tablets. *Pharmacol. Rev.* 25:229-237, 1973.

- Nutrition: Role of malabsorption. In: *Disaster in Bangladesh*. L. C. Chen, ed. Oxford University Press, New York, 1973, pp. 52-66.
- Progress in gastroenterology: Tropical enteropathy. *Gastroenterology* 64:637-652, 1973.
- Lindenbaum, J.; Butler, V. P., Jr.; Murphy, J. E. and Cresswell, R. M.
Correlation of digoxin-tablet dissolution-rate with biological availability. *Lancet* 1:1215-1217, 1973.
- Loeb, J. N.
A double-isotope method for comparing polyribosome populations: Effects of glucocorticoid hormone administration. *Endocrinology* 92:857, 1973.
- Loeb, J. N. and Sternschein, M. J.
Suppression of thymidine incorporation into the gastric mucosa of cortisone-treated rats: Possible relation to glucocorticoid-induced gastric ulceration. *Endocrinology* 92:1322, 1973.
- Loeb, J. N. and Yeung, L. L.
Effects of cortisone on thymidine incorporation by various nonlymphoid tissues of the weanling rat. *Proc. Soc. Exper. Biol. & Med.* 143:502, 1973.
- Manger, W. M.; Werner, S. C.; Coburn, R. J.; Goldstein, M.; Manger, C. C. III and Dufton, S.
Spontaneous hypertension in the rat: Its pathogenesis and problems as a hypertensive model. *International Research Communications System* April, 1973.
- Marks, P. A.
Thalassemia syndromes. *Pahlavi M. J.* 3:499-511, 1972.
- Marubio, A. T., Jr.; Lombardo, R. P. and Holt, P. R.
Control of variceal bleeding by superior mesenteric artery pitressin perfusions: Complications and indications. *Am. J. Digest. Dis.* 18:539, 1973.
- Mathur, P. P. and Case, R. B.
Phosphate loss during reversible myocardial ischemia. *J. Molec. & Cell. Cardiol.* 5:375-393, 1973.
- McCray, R. S.
Direct vision gastric biopsy. *Gastroenterol. Jap.* 7:113, 1972.
Duodenoskopie: Erfahrung des ersten Jahres. *Zeitschr. Gastroenterol.* 2:103, 1973.
- Meltz, D. J. and Cushman, P.
Hyperaldosteronism: The key to diagnosis. *Consultant* 12:126, 1972.
- Meltz, D. J. and Grieco, M. H.
Characteristics of *Serratia marcescens* pneumonia. *Arch. Int. Med.* 132:359-364, 1973.
- Menendez, C. and Rivlin, R. S.
Endocrine emergencies: Thyroid storm and myxedema coma. *Med. Clin. North America*, November, 1973.
- Morgan, F. J.; Birken, S. and Canfield, R. E.
Comparison of chorionic gonadotropin and luteinizing hormone: A note on a proposed significant structural difference in the beta subunit. *FEBS Letters* 31:101, 1973.
- Morgan, F. J.; Canfield, R. E.; Vaitukaitis, J. L. and Ross, G. T.
Preparation and characterization of the subunits of human chorionic gonadotropin (hCG). In: *Methods in Investigative and Diagnostic Endocrinology*. S. A. Berson, ed. A.S.P. Biological & Medical Press, North-Holland Pub. Co., Amsterdam, 1973.
- Morgan, F. J.; Kammerman, S. and Canfield, R. E.
Chemistry of human chorionic gonadotropin. In: *Handbook of Physiology; Endocrinology*. R. O. Greep, ed. American Physiology Society, Washington, D. C., 1973.
- Muto, Y.; Smith, F. R. and Goodman, DeW. S.
Comparative studies of retinol transport in plasma. *J. Lipid Res.* 14:525-532, 1973.
- Natta, C.; Banks, J.; Niazi, G.; Marks, P. A. and Bank, A.
Decreased β globin messenger RNA activity in bone marrow cells in homozygous and heterozygous β thalassemia. *Nature* 244:280, 1973.
- Neu, H. C.
A new antibiotic combination of unusually broad spectrum. *Med. Times* 101:47, 1973.
Antibiotic usage in renal failure. *Resident & Staff Phys.* 19:43, 1973.
Antimicrobial agents—Mechanisms of action and clinical usage. *Current Problems in Surgery*, June, 1973.
5-Fluorocytosine (Ancobon)—An oral antifungal agent for deep seated infections. *Resident & Staff Physician* 19:58, 1973.
Newer antibiotics. *Disease of the Month*, May, 1973.
Opportunistic Infections. MedCom, New York, 1973.
- Neu, H. C.; Cherubin, C.; Vogt, M.; Huber, P.; Glazer, S. and Winter, H.
Antibiotic resistance of fecal *E. coli* from children of low and high socio-economic groups. *Am. J. Dis. Child.* 126:174, 1973.
- Neu, H. C.; Huber, P. J. and Winshell, E. B.
Interbacterial transfer of R-factor in the human. *Antimicrob. Ag. & Chemother.* 3:542, 1973.
- Neu, H. C. and Winshell, E. B.
In vitro studies of cephanone, a 3-heterocyclic-thiomethyl cephalosporin derivative. *J. Antibiotics* 26:160, 1973.
- Noel, G. L.; Suh, H. K. and Frantz, A. G.
L-dopa suppression of TRH-stimulated prolactin release in man. *J. Clin. Endocrinol.* 36:1255-1258, 1973.
- Onuora, C. A.; Lindenbaum, J. and Nossel, H. L.
Case report: Massive hemorrhage associated with circulating antibodies to factor V. *Am. J. Med. Sc.* 265:407-417, 1973.
- Orenstein, J. M. and Weinstein, I. B.
Filamentous forms of type C particles in cell cultures from chemically induced rat hepatomas. *Cancer Res.* 33:1998-2004, 1973.
- Osserman, E. F.; Klockars, M.; Halper, J. and Fischel, R. E.
Effects of lysozyme on normal and transformed mammalian cells. *Nature* 243:331-335, 1973.

- Permutt, M. A.; Kelly, J. J.; Bernstein, R. S.; Siegel, B.; Alpers, D. H. and Kipnis, D. M.
Alimentary hypoglycemia in the absence of gastrointestinal surgery. *New England J. Med.* 288:1206, 1973.
- Pezzimenti, J. F. and Lindenbaum, J.
Megaloblastic anemia associated with erythroid hypoplasia. *Am. J. Med.* 53:748-754, 1972.
- Phillips, L. L.; Weiss, H. J.; Pessar, L. and Christy, N. P.
Effect of puff adder venom on the coagulation mechanism. I. *In vivo*. *Toxicon* 11:423, 1973.
- Pi-Sunyer, X. and Cushman, P.
Sheehan's syndrome and diabetes melitus. Observations on the Houssay phenomenon in man. *Am. J. Med. Sc.* 264:143, 1972.
- Primack, M. P.; Tapley, D. F. and Buchanan, J. L.
Thyroxine stimulated mitochondrial protein synthesis supported by an ATP generating system. *Endocrinology* 91:840-844, 1972.
- Quartermain, D.; Judge, M. E. and Van Itallie, T. B.
Hunger drive during starvation in rats enriched with odd-carbon fatty acids. *Proc. Soc. Exper. Biol. & Med.* 143:929-931, 1973.
- Radichevich, I.; Morse, J. H. and Werner, S. C.
IgM, not 7S-IgM, as cause of increased serum in goiter patients. *Proc. Soc. Exper. Biol. & Med.* 139:353-354, 1972.
- Reichman, L. B.; Shim, S.; Baden, M. and Richter, R.
Development of tolerance to street heroin in addicted and non-addicted primates. *Am. J. Pub. Health.* 63: 801-803, 1973.
- Rifkind, R. A.; Cantor, L. N.; Cooper, M. C.; Singer, D.; Maniatis, G. M. and Marks, P. A.
Culture of normal and malignant erythropoietic precursor cells from fetal and adult mice. In: *Proc. Second International Workshop on Hemopoiesis in Culture*, Warrenton, Virginia, 1973.
- Rivlin, R. S.
Regulation of riboflavin metabolism by thyroid hormone. In: *The Neurosciences, Third Study Program*. F. O. Schmidt and F. G. Worden, eds. MIT Press, Boston, 1973, pp. 835-840.
Riboflavin and cancer: A review. *Cancer Res.* 33:1977-1986, 1973.
- Rivlin, R. S.; Hornibrook, R. and Osnos, M.
Effects of riboflavin deficiency upon concentrations of riboflavin, flavin mononucleotide and flavin adenine dinucleotide in Novikoff hematoma in rats. *Cancer Res.* November, 1973.
- Rochester, D. F.
Clinical Pulmonary Physiology, 2nd ed. New York Trudeau Society, New York, 1973.
The diaphragm: Nobilissimus post cor musculus. Perspective. *Am. J. Med. Sc.* 265:215-217, 1973.
- Rochester, D. F. and King, T. K. C.
Graphic Aids in Blood Gas Analysis. American Thoracic Society, New York, 1972.
- Rochester, D. F. and Pradel-Guena, M.
Measurement of diaphragmatic blood flow in dogs from 133 xenon clearance. *J. Appl. Physiol.* 34:68-74, 1973.
- Rochester, D. F.; Wichern, W. A., Jr.; Fritts, H. W., Jr.; Caldwell, P. R. B.; Lewis, M. L.; Giutini, C. and Garfield, J. W.
Arteriovenous differences of lactate and pyruvate across healthy and diseased human lung. *Am. Rev. Resp. Dis.* 107:442-448, 1973.
- Rosner, W. and Christy, N. P.
Cushing's syndrome. In: *Current Therapy*. H. F. Conn, ed. W. B. Saunders Co., Philadelphia, 1973, p. 448.
- Rosner, W. and Darmstadt, R. A.
Demonstration and partial characterization of a rabbit serum protein which binds testosterone and dihydrotestosterone. *Endocrinology* 92:1700-1707, 1973.
- Rosner, W.; Darmstadt, R. and Tauster, S. J.
The kinetics of cortisol dissociation from purified human corticosteroid-binding globulin: Studies in a flowing system. *J. Steroid Biochem.* 4:249-255, 1973.
- Rubenstein, H. A.; Butler, V. P., Jr. and Werner, S. C.
Progressive decrease in serum triiodothyronine concentrations with human aging: Radioimmunoassay following extraction of serum. *J. Clin. Endocrinol.* 37: 247, 1973.
- Rubin, E.; Rybak, B. J.; Lindenbaum, J.; Gerson, C. D.; Walker, G. and Lieber, C. S.
Ultrastructural changes in the small intestine induced by ethanol. *Gastroenterology* 63:801-814, 1972.
- Rubin, R. C. and Ames, R. P.
Mammary tumor virus in experimental ependymoblastoma. *Prog. Neuropathol.* 2:335-349, 1973.
- Sassin, J.; Frantz, A. G.; Kapen, S. and Weitzman, E. D.
The nocturnal release of prolactin is dependent on sleep. *J. Clin. Endocrinol.* 37:436-440, 1973.
- Schmall, B.; Cheng, C. J.; Fujimura, S.; Gersten, N.; Grunberger, D. and Weinstein, I. B.
Modification of proteins by 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea (NSC 79037) *in vitro*. *Cancer Res.* 33, 1973.
- Schmidt, D. H.
A new approach to digitalis toxicity. In: *Controversies in Clinical Pharmacology and Drug Development*. R. Palmer, ed. Futura Pub. Co., Inc., New York, 1972.
- Seakins, M.; Gibbs, W. N.; Milner, P. F. and Bertles, J. F.
Erythrocyte Hb-S concentration. An important factor in the low oxygen affinity of blood in sickle cell anemia. *J. Clin. Invest.* 52:422, 1973.
- Sealey, J. E.; Bühler, F. R.; Laragh, J. H. and Vaughan, E. D., Jr.
The physiology of renin secretion in essential hypertension. *Am. J. Med.* 55:391-401, 1973.
- Sealey, J. E. and Laragh, J. H.
Physiological properties of a natriuretic humoral substance occurring in human urine and plasma. *Endocrinology* 1971; William Heineman Med. Books Ltd., 1972, pp. 401-410.

- Shubrooks, S. J.; Schneider, B.; Dubin, H. and Turino, G. M.
Acidosis and pulmonary hemodynamics in hemorrhagic shock. *Am. J. Physiol.* **225**:225-229, 1973.
- Smith, F. R.; Goodman, DeW. S.; Arroyave, G. and Viteri, F.
Serum vitamin A, retinol-binding protein, and prealbumin concentrations in protein-calorie malnutrition. II. Treatment including supplemental vitamin A. *Am. J. Clin. Nutrition* **26**:982-987, 1973.
- Smith, F. R.; Goodman, DeW. S.; Zaklama, M. S.; Gabr, M. K.; Maraghy, S. E. and Patwardhan, V. N.
Serum vitamin A, retinol-binding protein, and prealbumin concentrations in protein-calorie malnutrition. I. A functional defect in hepatic retinol release. *Am. J. Clin. Nutrition* **26**:973-981, 1973.
- Smith, J. E.; Milch, P. O.; Muto, Y. and Goodman, DeW. S.
The plasma transport and metabolism of retinoic acid in the rat. *Biochem. J.* **132**:821-827, 1973.
- Smith, J. E.; Muto, Y.; Milch, P. O. and Goodman, DeW. S.
The effects of chylomicron vitamin A on the metabolism of retinol-binding protein in the rat. *J. Biol. Chem.* **248**:1544-1549, 1973.
- Southworth, H.
Evaluation of programs in graduate medical education. *Bull. New York Acad. Med.* **49**:324-327, 1973.
- Stein, J. A. and Price, J. B.
Asymptomatic bilious ascites after percutaneous transhepatic cholangiogram; A case report. *Gastroenterology* **64**:1013-1014, 1973.
- Strauss, H. C. and Bigger, J. T., Jr.
Electrophysiological properties of the rabbit sinoatrial perinodal fibers. *Circ. Res.* **31**:490-509, 1972.
- Strauss, H. C.; Saroff, A.; Bigger, J. T., Jr. and Giardina, E. G. V.
Premature atrial stimulation as a key to the understanding of sino-atrial conduction in man: Presentation of data and critical review of the literature. *Circulation* **47**:86-93, 1973.
- Terada, M.; Cantor, L.; Rifkind, R. A.; Bank, A. and Marks, P. A.
Globin mRNA activity in erythroid precursor cells and the effect of erythropoietin. *Proc. Nat. Acad. Sci.* **69**:3575-3579, 1972.
- Terry, W. D.; Page, D. L.; Kimura, S.; Isobe, T.; Osserman, E. F. and Glenner, G. G.
Structural identity of Bence Jones and amyloid fibril proteins in a patient with plasma cell dyscrasia and amyloidosis. *J. Clin. Invest.* **52**:1276-1281, 1973.
- Tscherne, J. S.; Lanks, K. W.; Salim, P. D.; Grunberger, D.; Cantor, C. R. and Weinstein, I. B.
Studies on rat liver phenylalanyl-tRNA synthetase. II. Further purification, substrate specificity and effects of substrates on heat inactivation. *J. Biol. Chem.* **248**:4052-4059, 1973.
- Tscherne, J. S.; Weinstein, I. B.; Lanks, K. W.; Gersten, N. B. and Cantor, C. R.
Phenylalanyl-tRNA synthetase activity associated with liver ribosomes and microsomes. *Biochemistry* **12**:3859-3865, 1973.
- Turino, G. M.
Chemical structure and function of the lung. Panel Report. In: *Task Force Report on Respiratory Diseases*. U. S. Dept. of Health, Education and Welfare, Public Health Service, National Institutes of Health. Washington, D. C., 1972, pp. 15-29.
- Turino, G. M.; Goldring, R. M. and Heinemann, H. O.
Role of bicarbonate concentration in the regulation of ventilation in chronic obstructive lung disease. In: *CO₂ and Metabolic Regulation*. G. G. Nahas and K. E. Schaefer, eds. Springer-Verlag, New York, 1973.
- Van Jaarsveld, P. P.; Edelhoof, H.; Goodman, DeW. S. and Robbins, J.
The interaction of human plasma retinol-binding protein with prealbumin. *J. Biol. Chem.* **248**:4698-4705, 1973.
- Vaughan, E. D., Jr.; Bühler, F. R.; Laragh, J. H.; Sealey, J. E.; Baer, L. and Bard, R. H.
Renovascular hypertension: Renin measurements to indicate hypersecretion, and contralateral suppression, estimate renal plasma flow and score for surgical curability. *Am. J. Med.* **55**:402-414, 1973.
- Vaughan, E. D., Jr.; Gavras, H.; Laragh, J. H. and Koss, M. N.
Vascular permeability factor: Dissociation from the angiotensin II induced pressor and drinking responses. *Nature* **242**:334-336, 1973.
- Vaughan, E. D., Jr.; Laragh, J. H.; Gavras, H.; Bühler, F. R.; Gavras, H.; Brunner, H. R. and Baer, L.
The volume factor in low and normal renin essential hypertension: Its treatment with either spiro lactone or chlorthalidone. *Am. J. Cardiol.* **32**:523-532, 1973.
- Warner, V. D.; Warner, A. M.; Woods, S. C.; Vasselli, J. R.; Deche, E. and Pi-Sunyer, F. X.
Leucine and its derivatives as potential elicitors of insulin secretion in rats. *J. Pharmaceut. Sci.* **62**:1186-1188, 1973.
- Weinstein, I. B., Editor
Cellular Targets of Carcinogens. Interdisciplinary Communications Program, Smithsonian Institution, Washington, D. C., 1973.
Cellular Organelles as Targets of Carcinogens. Interdisciplinary Communications Program, Smithsonian Institution, Washington, D. C., 1973.
- Weinstein, I. B.; Gebert, R.; Stadler, U. C.; Orenstein, J. M. and Axel, R.
Type C virus from cell cultures of chemically induced rat hepatomas. *Science* **178**:1098-1100, 1972.
- Weiss, H. J.
Bleeding disorders due to abnormal platelet function. *Med. Clin. North America* **57**:517-530, 1973.

Weiss, H. J. and Ames, R. P.

Ultrastructural findings in storage pool disease and aspirin-like defects of platelets. *Am. J. Path.* **71**:447-459, 1973.

Weiss, H. J.; Berger, R. E.; Tice, A. D. and Phillips, L. L.

Fatal disseminated intravascular coagulation and hemolytic anemia following stibophen therapy; a study of basic mechanisms. *Am. J. Med. Sc.* **264**:375-384, 1972.

Weiss, H. J.; Phillips, L. L.; Hopewell, W. S.;

Phillips, G.; Christy, N. P. and Nitti, J. F.

Heparin therapy in a patient bitten by a saw-scaled viper (*Echis carinatus*), a snake whose venom activates prothrombin. *Am. J. Med.* **54**:653-662, 1973.

Weiss, H. J. and Rogers, J.

Platelet factor 4 in platelet disorders—Storage location and the requirement of endogenous ADP for its release. *Proc. Soc. Exper. Biol. & Med.* **142**:30-35, 1973.

Weiss, H. J.; Rogers, J. and Brand, H.

Properties of the platelet retention (von Willebrand) factor and its similarity to the antihemophilic factor (AHF). *Blood* **41**:809-815, 1973.

Zimmerman, E. A.; Hsu, K. C.; Robinson, A. G.;

Carmel, P. W.; Frantz, A. G. and Tannenbaum, M.

Studies on neurophysin secreting neurons with immunoperoxidase techniques employing antibody to bovine neurophysin I. Light microscopic findings in monkey and bovine tissues. *Endocrinology* **92**:931-940, 1973.

Microbiology

HAROLD S. GINSBERG

Professor and Chairman of the Department

Dr. Harry M. Rose, a faculty member since 1940, resigned as Chairman July 1, 1973. Since Dr. Rose became Chairman in 1952, he gave dynamic leadership to the development of strong education and research programs. He was an outstanding teacher and an authority on respiratory viral infections. His strengths will be sorely missed. Dr. Rose is now on terminal sabbatical leave.

Dr. Harold S. Ginsberg, formerly Professor and Chairman of the Department of Microbiology, University of Pennsylvania School of Medicine, succeeded Dr. Rose. Dr. Ginsberg, who was active in new programs in medical education at Western Reserve and University of Pennsylvania School of Medicine, is a virologist whose major research is concerned with the regulation of viral replication and the imposition of viral controls on host cells.

Dr. Stuart W. Tanenbaum, Professor of Microbiology, a member of the Department since 1953, resigned to accept the position of Dean at the School of Biology, Chemistry, and Ecology, College of Environmental Science and Forestry, State University of New York at Syracuse. Dr. Iris L. Doerr, Research Associate, accepted a position as Research Associate in the Department of Chemistry. Dr. Lau Wei Lo, Research Associate, left to accept a position in Victoria, British Columbia.

Dr. Paul A. Granato completed his training in clinical microbiology and assumed the position of Director, Microbiology Laboratory, Waterbury Hospital, Waterbury, Conn.

Dr. Dean L. Engelhardt joined the faculty as

Assistant Professor of Microbiology. Dr. Engelhardt was in the Division of Biological Sciences, University of Connecticut, where he became well-known for studies on the mechanisms of contact-inhibition of mammalian cells and the action of interferon. Dr. Donald H. Harter became Professor of Neurology and Microbiology. New postdoctoral fellows were Dr. Timothy H. Carter (Matheson Fellow), Dr. Marcia J. Ensinger (Matheson Fellow), and Dr. Allen J. Mayer (Fellow of the American Cancer Society).

Twenty-five candidates for the degree of Doctor of Philosophy in Microbiology, including five new students, were in residence during 1973. In addition, three Ph.D. students from other universities are carrying out thesis research with members of the Department. Dr. Richard N. Hjorth received his Ph.D. degree in June, 1973 and is now at the Walter Reed Army Institute of Research, Washington, D. C. Mrs. Diane T. Corenzwit and Mr. Michael J. Shereff received the M.A. degree. Seven graduate students are candidates for the M.S. degree in Clinical Microbiology.

Dr. Bernard F. Erlanger, with Mr. Norbert H. Wassermann and Mrs. Anne G. Cooper, continued research on photoregulation and on synthesis and characterization of reagents specific for acetylcholinesterase and the acetylcholine receptor of the electric eel. Experiments with the electric eel were carried out with the collaboration of Dr. David Nachmansohn (Biochemistry) and his colleagues.

Work also continued on the immunochemistry of

DNA-reactive antibodies, a project begun with the late Dr. Sam M. Beiser. Mr. Robert C. Lauer, a graduate student, continued studies on the effect of anti-thymidine antibodies on transformed cells and developed an enzyme-immunoassay for anti-adenosine antibodies. With Dr. Koji Nakanishi (Chemistry), Mr. Lauer produced antibodies to the Y base of phenylalanine-transfer RNA and is using the antisera to study the conformation of the RNA molecule in solution by spectrofluorimetry. In an additional study with Dr. Nakanishi, immunochemical techniques were applied to the study of insect hormones. Miss Rose M. D'Alisa, a graduate student, succeeded in preparing antibodies to several codons, including AUG, and is characterizing them in order to use them as biochemical tools. The use of nucleic acid-reactive antibodies for identification and chemical mapping of chromosomes is being continued in collaboration with Dr. Orlando J. Miller (Obstetrics and Gynecology, Human Genetics and Development).

Dr. Erlanger gave seminars or participated in symposia during 1972-73 at The New Jersey College of Medicine and Dentistry, Newark, N. J.; New York Heart Symposium, New York City; Sloan-Kettering Institute; New York University; Union Carbide Corp., New York City; Stuyvesant High School, New York City; Ciba-Geigy, New York City; and the Roche Institute of Molecular Biology, Nutley, N. J.

The immunochemical laboratories under Dr. Elvin A. Kabat are operated jointly by the Departments of Microbiology, Neurology, and Human Genetics and Development. The laboratories' research is concerned with understanding how the sequence of a polypeptide chain determines its three-dimensional structure, the nature of the antibody combining site, elucidating the structures of A, B, H, Le^a, Le^b, and I blood group substances, studies on myeloma proteins which bind dextrans and levans, research on human antibodies to polysaccharides, and investigations on purification and characterization of various lectins (plant and animal hemagglutinins) with blood group specificity.

The studies on three-dimensional folding of proteins were carried out by Dr. Kabat with Dr. Tai Te Wu (Departments of Physics and Engineering Sciences, Northwestern University). A basic principle established is that the nearest neighboring amino acids profoundly influence the conformation of the middle amino acid in the peptide chain. Thus the two angles, the angle between peptide NH and the α carbon, Φ , and the angle between the α carbon and the CO of the peptide bond, Ψ , of the middle amino acid are largely determined by the amino acids on

either side. By examining a number of proteins whose three-dimensional structure had been established by x-ray crystallographic studies, tables of tripeptides and the Φ , Ψ angles of the middle amino acid could be compiled, giving the frequency with which the middle amino acid was in an α -helical or β -sheet conformation. Such tables indicated that certain tripeptides did not occur in an α -helix, others did not occur in a β -sheet conformation; such tripeptides were termed α -helix breaking or β -sheet breaking, respectively. The portions of the polypeptide chain between two α -helix breaking or two β -sheet breaking residues were termed permissively helical or permissively β -sheet regions. Applying this method to the sequence of a given protein, an indication of which portions of the polypeptide chain could be in an α -helix or a β -sheet could be obtained; this procedure was successfully applied to concanavalin A: The β -sheets were generally found to occur between β -sheet breaking residues. An interesting finding on abnormal hemoglobins was that in certain instances, the mutation would break one of the α -helices; of especial potential genetic significance was that the break would occur at the amino acid preceding or following the mutation rather than at the mutant amino acid itself.

An additional procedure developed by Drs. Wu and Kabat, when a set of homologous sequences is available, permits the actual selection of Φ , Ψ angles for all the amino acids from data on known tripeptides; this was applied using the sequences of 18 cytochromes c and quite good agreement with experimental values obtained. Dr. Luciana Rovis, now at the University of Turino, Dr. Byron E. Anderson, now Assistant Professor of Biochemistry, Northwestern University, and Dr. Kabat, with Flavio Gruezo and Jerry B. Liao, studied the oligosaccharide fragments obtained by alkaline borohydride degradation of two human ovarian cyst blood group substances, one with Le^a and the other H and Le^b activity. The latter, substantially higher in fucose content, yielded oligosaccharide fragments larger than those from the Le^a substance. The patterns of heterogeneity of these materials were compared; 19 oligosaccharides were isolated and their structures determined; their biological properties were studied with Dr. Miercio E. A. Pereira and Dr. Ten Feizi, who is now at the Clinical Center in London. Drs. Pereira and Kabat purified a lectin with blood group H specificity from *Lotus tetragonolobus* and showed it to react specifically only with one of the two types of oligosaccharide chain in the blood group H substance, the type 2 chain of the structure α L-fucosyl (1 \rightarrow 2) β D-galactosyl (1 \rightarrow 4) N-acetylglucosamine, and not with the α L-fucosyl(1 \rightarrow 3)N-acetylglucosa-

mine. Thus the Lotus lectin is of great value in distinguishing between these two closely related structures.

Miss Florence S. Maisonrouge, a graduate student (Human Genetics and Development), is studying two fractions of a human ovarian cyst blood group B substance, one insoluble in 90 per cent phenol and the other soluble in 90 per cent phenol but precipitable from phenol by 20 per cent ethanol. These fractions differ in their blood group B and blood group I and i activities; isolation of oligosaccharides and elucidation of their structures are in progress. Mr. Walter Newman, a graduate student in Chemical Biology, is studying horse stomach blood group B substance and a substance from horse stomachs lacking blood group A, B, and H activity. Miss Aida Cholakian and Dr. Kabat are continuing quantitative immunochemical determinations of immunoglobulins in cerebrospinal fluid. Miss Ingrid M. Outschorn, a graduate student, and Dr. Kabat are studying idiotypic specificities of human antidextran and antilevan. Mr. Edward C. Kisailus, a graduate student, is characterizing blood group substances from several human ovarian cysts and is also developing enzyme immunoassay methods. Mr. Raymond J. Monk, Miss Maisonrouge, and Dr. Kabat are characterizing various lectins by circular dichroism.

Drs. Mitsuo Torii, Keiko Sakakibaru (Research Institute for Microbial Diseases, Osaka, Japan), and Dr. Kabat completed a study of human and rabbit antibodies specific for dextrans with a high proportion of α (1 \rightarrow 2) linkages; Dr. Torii returned to Columbia for three months under the United States-Japan Cooperative Science Program. Dr. John O. Cisar, U.S.P.H.S. Fellow, Dr. Kabat, and Mr. Liao, with Dr. Michael Potter (N.I.H.), studied several mouse myeloma proteins with specificity for dextrans and fructosans. One myeloma protein had a combining site complementary to a terminal chain of six α (1 \rightarrow 6) linked glucoses, two myeloma proteins had sites complementary to a chain of five α (1 \rightarrow 6) linkages, and one was complementary to a chain of three α (1 \rightarrow 3) linked glucoses. Myeloma proteins with antifructosan activity fell into two groups, one specific for β (2 \rightarrow 1) linked fructoses and the other for (2 \rightarrow 6) linked fructoses. The myeloma proteins have molecules with homogeneous combining sites of a given size and thus appear to represent monoclonal proteins selected from a large population with a range of combining sites comparable to those found with antibodies to dextrans.

Dr. Kabat attended an International Colloquium

on Glycoproteins at Lille, France, and a Rockefeller Foundation Conference on Tse-Tse Flies at Bellagio, Italy, and participated in the American Association of Immunologists' course at Woods Hole. He was appointed a member of the Advisory Board of the Brazilian Society of Immunologists and is serving on the Scientific Committee of the New York Blood Center, the Committee on Viral Hepatitis of the National Research Council, and the Expert Advisory Committee on Immunology at the World Health Organization. He was also invited to the Basel Institute of Immunology. He is one of the original incorporators of the International Laboratory for Research in Animal Diseases in Nairobi, Kenya, which is being set up under the World Bank, Rockefeller Foundation, United Nations Development Fund, and other international organizations. Dr. Kabat was named a Fogarty Scholar by the N.I.H. and will spend a sabbatical year there.

Drs. Joe E. Coward and Councilman Morgan, with Dr. Adam Friedmann, studied the development of herpes simplex virus using hydroxyurea to synchronize the cycle of virus development. The sequence of packaging of the nucleoprotein core of the virus was observed using this technique. Drs. Coward and Donald H. Harter (Neurology), with Dr. Friedmann, continued to study the morphology of visna virus. The size and configuration of viral RNA were determined using the Kleinschmidt technique of spreading nucleic acids and electron microscopy. With Dr. Herbert S. Rosenkranz, studies continued on the mode of action of silver sulfadiazine on pathogenic microorganisms. It was determined that the site of action of this drug is at the bacterial membrane, causing blebs to be found at the cell surface.

Dr. Paul D. Ellner continued his active postdoctoral training program in clinical microbiology despite limited funds provided by the Metropolitan Pathology Laboratories, Inc. The Master's program in Clinical Microbiology is also still active. No new trainees were accepted into either of these important training programs owing to lack of financial support. Dr. Ellner's research studies are concerned with evaluation of $^{14}\text{CO}_2$ production for detecting bacteremia; laboratory comparison of the *in vitro* spectrum of cefoxitin and cephalothin; and evaluation of an agar-coated dip stick for urine culture. Projects completed include detection of bacteriuria by a luciferin-luciferinase ATP assay, and development of a system for recovering and identifying anaerobic bacteria in the clinical laboratory. The Diagnostic Microbiology Service, directed by Dr. Ellner, performed over 176,000 determinations in 1972. On

August 10, 1973, the Diagnostic Microbiology Service occupied new quarters on the third floor of Babies Hospital Annex. The Service still awaits a much-needed laboratory computer system.

Dr. Rosenkranz and his associates further refined their previously developed simple bioassay for detecting potential mutagens and carcinogens. This assay is now being evaluated in a number of laboratories under the sponsorship of the Division of Cancer Cause and Prevention of the National Cancer Institute. Preliminary reports indicate that the bioassay compares favorably with standard procedures for determining mutagenicity and carcinogenicity. Dr. Rosenkranz and his colleagues are taking advantage of the availability of this simple and rapid system in studies to determine structure-activity relationships among groups of closely related chemicals. The assay has also been adapted for the detection of environmental mutagens and carcinogens. A number of agents which heretofore had not been thought to possess mutagenic and carcinogenic potentials were identified. The chemical basis of their activity is now being investigated.

The study of the mechanism of action of hydroxyurea continued to occupy the attention of Dr. Rosenkranz and his collaborators. The agent selectively and reversibly blocks DNA synthesis in prokaryotic and eukaryotic cells. Miss Mary Ellen Leder, a medical student, and Miss Monica Fenick, a graduate student, focussed attention on the role of nucleoside diphosphate reductase in this inhibition. These studies, which are continuing, indicate that this enzyme is not involved in the inhibitory effect of this agent.

Dr. Rosenkranz reconfirmed his previous finding of the presence of an RNA segment covalently linked to the DNA of coliphage T5. With Dr. Yechiel Becker, Hebrew University Hadassah Medical School, the presence of such an RNA in the DNA of herpes simplex virus was also found. The structure and biosynthetic role of this material are being investigated. With Messrs. Howard S. Carr and Theodore J. Wlodkowski, the mode of action and spectrum of bacterial sensitivities to the new topical antimicrobial agent silver sulfadiazine were studied. This drug, which is very effective in the treatment and prevention of infections of burns and wounds, acts primarily at the cell surface of both Gram-positive and Gram-negative bacteria. Some 718 clinical isolates representing 22 bacterial and 5 fungal species were sensitive to readily achievable levels of the drug, thus indicating a broad spectrum of action.

Dr. Rosenkranz collaborated with Dr. Coward in examining the ultrastructure of bacteria exposed to

metabolic inhibitors. It was found that agents which block cellular DNA exposed bacteria to elaborate excessive amounts of cell wall material. The nature of this material is under investigation, but it would appear that synthesis of both DNA and cell wall material is regulated by the cytoplasmic membrane and that a disruption in DNA synthesis results in increased cell wall synthesis.

In collaboration with Drs. Morgan and Friedmann, it was shown that all herpes simplex virus (HSV) specified proteins and glycoproteins were synthesized in the complete absence of DNA synthesis blocked by hydroxyurea. Upon reversal of the hydroxyurea-induced block, production of infectious virus resumed. The rate of viral DNA and protein synthesis was similar to that seen during the normal course of HSV-infection. Viral proteins made during the drug-induced inhibition were incorporated into infectious virus following removal of the inhibitor. Upon reversal of the block a certain degree of developmental synchrony permitted visualization of the viral assembly process. Evidence for the presence of a large-molecular-weight precursor of viral proteins was obtained.

Dr. Tanenbaum continued efforts to attain insight into the mechanism of action of cytochalasin D. This substance, a representative of a number of congeneric fungal metabolites which exhibit profound but reversible effects upon mammalian cells in culture, was prepared in tritiated form by Dr. Lo, with Drs. R. Ehrenkauf and A. Wolf, Brookhaven National Laboratory. The uptake and binding of the labeled drug to a variety of cultured cell lines were studied by Miss Janet Tannenbaum, a graduate student. Considerable progress was achieved in these experiments on pinpointing the subcellular localization of cytochalasin D. Further work is in progress to identify the major macromolecular components responsible for high and low affinity sites of binding. Joint efforts with Dr. Gabriel C. Godman's group (Pathology), which include the contributions of Dr. Arline D. Deitch, Mr. Armand F. Miranda, and Mr. Stanley G. Sawicki, established that early events in the action of this drug are manifested by highest sensitivity in the G_1 phase of the cell cycle. It was also observed that cytochalasins enhance the infectivity of poliomyelitis virus and other RNA viruses, augmentation occurring early in the eclipse period of viral development. In an investigation with Drs. Elena and Saul Puszkin (Mt. Sinai Medical School) concerned with the action of cytochalasin D on human blood platelets, it was found that one target site of the drug is platelet myosin. It appears that cytochalasin D inhibits thrombosthenin-M ATPase

activity and indeed competes with actin for a binding region on this contractile protein. These findings were extended to include interactions of the alkaloid with muscle myoxin. Along another line of endeavor with Dr. Doerr, a program of synthesis of vinyl polymers which contain tRNA-specific minor bases was initiated. Though the first polymers which were prepared did not seem to be antigenic, evidence was obtained for their cross-reaction with other anti-nucleic acid antibodies. Dr. Tanenbaum presented seminars at Albert Einstein College of Medicine and New York University.

Dr. Konrad C. Hsu, with Dr. Calderon Howe (Louisiana State University Medical Center), continued to study hemolytic anemia of NZB mice by characterizing the murine erythrocyte membrane glycoproteins chemically and immunochemically in relation to the specificity of the autoantibody. With Dr. Giuseppe A. Andres, State University of New York at Buffalo, light, electron, and immunofluorescence microscopy were used to study the glomeruli of 48 renal allografts from rats injected with phytohemagglutinin (PHA) and 51 control kidneys. Glomerular endothelial and mesangial lesions associated with lymphocytes and blast cell infiltration were detected by electron microscopy in about 50 per cent of allografts performed between Carworth rats or between Long Evans and Lewis rats when the animals were injected with PHA 1-3 days after transplantation. This experimental model of glomerulitis mediated with the cooperation of a lymphocytotoxic mechanism may have application for study of cell-mediated injury in glomerular structures.

The relation of HL-A antigens with human species-specific antigens was investigated by means of mixed agglutination and immunoelectron microscopy using cultures of an established human cell line, HEp-2, and man-mouse hybrid cells which contain HL-A and species-specific antigens. Employing ferritin-conjugated anti-human and anti-rabbit IgG antibodies with electron microscopy, it was shown that HL-A antigens are scattered in scarce patches and the species-specific antigens are densely distributed all over the plasma membrane. With Drs. Beatrice C. Seegal, Myron Tannenbaum (Pathology), Conrad Pirani (Pathology), and William R. Groszold (Pediatrics), 119 kidney specimens obtained by biopsy from patients of Columbia-Presbyterian Medical Center, including those from the Kidney Transplantation Unit, were examined by immunofluorescence during the current year.

With Dr. John K. Lattimer (Urology), study of the immunologic profiles of human genitourinary and mammary tumors was initiated. With Drs. See-

gal and Tannenbaum, tumors from 90 patients, 50 of which were malignant, were examined by direct immunofluorescence microscopy. Owing to the paucity of such reports in the literature, it was amazing to find the intensive localization of so many antigens and host globulins and complement in the cancer cells. With Drs. Robert E. Bases (Albert Einstein Medical College) and Doreen S. Liebeskind (N.I.H. Fellow in Radiology), drug-induced changes in DNA during the G₁ phase of the cell cycle were studied using HeLa cells, incubated with camptothecin. Nuclear fluorescence was seen after staining with fluorescein-labeled antinucleoside antibodies; if the G₁ cells were first washed free of the drug before staining, the nuclear fluorescence could be no longer demonstrated. This was correlated with the return of G₁ DNA to a normal sedimentation pattern on alkaline sucrose gradients. Since these antibodies react only with single-stranded DNA, the positive staining in camptothecin-treated G₁ cells suggests that the drug induces denatured regions in DNA and this effect is readily reversible upon removal of the drug.

With Drs. Earl A. Zimmerman (Neurology), Richard D. Defendini (Pathology), and Alan Robinson (University of Pittsburgh), neurophysin, the carrier protein for vasopressin, was localized in human autopsied hypothalamus in supraoptic and paraventricular neurons by the immunoperoxidase bridge technique. The antiserum specific for neurophysin prepared by Dr. Robinson was used at extremely high dilution, at 1:100,000 in this method and at 1:200,000 in radioimmunoassay. It was estimated that the immunoperoxidase technique for human neurophysin can detect femtogram (10⁻¹⁵) amounts in single cells, and thus this technique is more sensitive than radioimmunoassay. During May Dr. Hsu was Visiting Professor, Department of Pathology, Ulm University, Ulm/Donau, West Germany, lecturing on the study of Group A streptococcal polysaccharide by immune electron microscopy.

Dr. Spyros M. Vratsanos studied the submaxillary saliva from patients with cystic fibrosis and from normal individuals to determine the distribution of molecular weights, the content of protein and carbohydrate, and the significance of the protein-carbohydrate components in the organization of the molecules. Acid production as a metabolic effect of bacteria in the formation of dental plaque was studied, and work on the mechanisms of degradation and elimination of proteins in dental enamel undertaken.

The Department gratefully acknowledges support

of research activities from the American Cancer Society, the American Heart Association, the George A. Carden, Jr., Special Fund for Cancer Research, the Irene Heinz Given and John La Porte Given Foundation, the Philip Hanson Hiss, Jr., Memorial Fund, the Marion Laboratories, Inc., the Matheson Foundation, Merck & Co., Inc., Metropolitan Pathology Laboratories, Inc., the Agnes G. Milliken

Foundation, the National Institutes of Health, the National Science Foundation, the Damon Runyon Memorial Fund for Cancer Research, the Office of the Surgeon General, Department of the Army, Organon, Inc., the Schering Corp., the Joseph B. Stevens Memorial Fund, Harry M. Stevens, Inc., the U.S. Department of Agriculture, and the Helen Hay Whitney Foundation.

1973 Publications

Microbiology

Andres, Giuseppe A.; Hsu, Konrad C. and Seegal, Beatrice C.

Immunologic technique for the identification of antigens or antibodies by electron microscopy. In: *Handbook of Experimental Immunology*, 2nd ed. D. M. Weir, ed., Blackwell Scientific Publications, Oxford, 1973, pp. 34.01-34.45.

Beiser, Sam M. and Erlanger, Bernard F.

Nucleic acid structures as antigenic determinants. In: *Specific Receptors of Antibodies, Antigens and Cells. Proc. Third Int'l Convoc. on Immunology*. N. R. Rose, D. Pressman, T. B. Tomasi, Jr., and A. Grossberg, eds. S. Karger, Basel, 1973, pp. 106-117.

Bieth, Joseph; Vratsanos, Spyros M.;

Wassermann, Norbert H.; Cooper, Anne G. and Erlanger, Bernard F.

Photoregulation of biological activity by photochromic reagents. Inactivators of acetylcholinesterase. *Biochemistry* 12: 3023-3027, 1973.

Blum, G.; Ellner, P.; McCarthy, L. and Papachristos, T. Reliability of the treponemal hemagglutination test for the serodiagnosis of syphilis. *J. Infect. Dis.* 127: 321, 1973.

Breese, Sydney S. Jr. and Hsu, Konrad C.

Methods for the application of ferritin-tagged antibodies. In: *The Immune Response at the Cellular Level*. T. P. Zacharia, ed. Marcel Dekker, New York, pp. 59-72.

Coward, Joe E.; Carr, Howard S. and Rosenkranz, Herbert S.

Silver sulfadiazine: Effect on the ultrastructure of *Pseudomonas aeruginosa*. *Antimicrob. Ag. Chemother.* 3:621-624, 1973.

Coward, Joe E.; Harter, Donald H.; Hsu, Konrad C. and Morgan, Councilman

Ferritin-conjugated antibody labeling of visna virus. *Virology* 50:925-930, 1972.

Dev, Vaithilingam G.; Warburton, Dorothy;

Miller, Orlando J.; Miller, Dorothy A.;

Erlanger, Bernard F. and Beiser, Sam M.

Consistent pattern of binding of anti-adenosine antibodies to human metaphase chromosomes. *Exper. Cell Res.* 74:288-293, 1972.

Duffy, Philip; Wolf, Abner; Harter, Donald H.;

Gamboa, Eugenia T. and Hsu, Konrad C.

Murine influenza encephalomyelitis. II. Electron microscopic observations. *J. Neuropath. & Exper. Neurol.* 32:72-91, 1973.

Ellner, P. D. and McCarthy, L. R.

Aeromonas shigelloides bacteremia: A case report. *Am. J. Clin. Path.* 59:216, 1973.

Erlanger, Bernard F.

Principles and methods for the preparation of drug protein conjugates for immunologic studies. *Pharmacol. Rev.* 25:271-280, 1973.

Erlanger, Bernard F.; Senitzer, David; Miller, Orlando J. and Beiser, Sam M.

Nucleic acid-reactive antibodies specific for nucleosides and nucleotides. *Acta endocrinol. Suppl. No.* 168:206-221, 1972.

Erlanger, Bernard F.; Wassermann, Norbert H. and Cooper, Anne G.

Allosteric activation of chymotrypsin-catalyzed hydrolysis of specific substrates. *Biochem. Biophys. Res. Commun.* 52:208-215, 1973.

Feiner, Rose; Coward, Joe E. and Rosenkranz, Herbert S.

Effect of hydroxyurea on *Staphylococcus epidermidis* and *Micrococcus lysodeikticus*: Thickening of the cell wall. *Antimicrob. Ag. Chemother.* 3:432-435, 1973.

Girardi, Anthony; Hampar, Berge; Hsu, Konrad C.;

Oreszlup, Stephan; Kelloff, Gary; Hornberger, Elizabeth and Gilden, Raymond V.

Intracellular localization of mammalian type C virus species-specific (gs-1) and interspecies-specific (gs-3) antigenic determinants by light microscopy employing the indirect immuno-peroxidase technique. *J. Immunol.* 111:152-163, 1973.

Gordin, Menachem; Olshevsky, Udy;

Rosenkranz, Herbert S. and Becker, Yechiel

Studies on herpes simplex virus DNA. I. Denaturation properties. *Virology* 55:280-284, 1973.

Griswold, William R.; Hsu, Konrad C. and

McIntosh, Rawle M.

Cryoprecipitates and immune complexes: Decrease in antibody bound I*BSA antigen after cryoprecipitation in rabbit serum. *Proc. Soc. Exper. Biol. & Med.* 142: 1292-1294, 1972.

- Honig, Barry; Kabat, Elvin A.; Katz, Lou; Levinthal, Cyrus and Wu, Tai Te
Model-building of neurohypophyseal hormones. *J. Molec. Biol.* **80**:277-295, 1973.
- Hsu, Konrad C.; Zimmerman, Earl A.; Rudin, Leonard; LoGerfo, Paul; Bennett, Sidney and Tannenbaum, Myron
Application of immunoperoxidase bridge technique in studies of tumor tissues with antibody to tumor-associated-antigen (TAA). In: *Proc. 2nd Conf. and Workshop on Embryonic and Fetal Antigens in Cancer*. Oak Ridge, Tenn. Feb. 14-16, 1972, pp. 147-151.
- Kabat, E. A.
General features of antibody molecules. In: *Specific Receptors of Antibodies, Antigens and Cells. Proc. Third Int'l Convoc. on Immunology*. R. N. Rose, D. Pressman, T. B. Tomasi, Jr., and A. Grossberg, eds. S. Karger, Basel, 1973, pp. 4-30.
- Kabat, Elvin A., and Wu, Tai Te
The influence of nearest-neighbor amino acids on the conformation of the middle amino acid in proteins: Comparison of predicted and experimental determination of β -sheets in concanavalin A. *Proc. Nat. Acad. Sci.* **70**:1473-1477, 1973.
The influence of nearest-neighboring amino acid residues on aspects of secondary structures of proteins. Attempts to locate α -Helices and β -Sheets. *Biopolymers* **12**:751-774, 1973.
- Kano, Kyoichi; Andres, Giuseppe A.; Hsu, Konrad C. and Milgram, Felix
Relationships of HL-A antigens to human species specific antigens. *Internat. Arch. All. App. Immunol.* **43**: 608-614, 1972.
- Minio, Franco; Howe, Carl; Hsu, Konrad C. and Rifkind, Richard A.
Antigen density on differentiating erythroid cells. *Nature* **237**:187-188, 1972.
- Miyoshi, Koho; Wolf, Abner; Harter, Donald H.; Duffy, Philip; Gamboa, Eugenia and Hsu, Konrad C.
Murine influenza encephalomyelitis. I. Neuropathological and immunofluorescence findings. *J. Neuropath. & Exper. Neurol.* **32**:51-71, 1973
- Morgan, Councilman
The use of ferritin-conjugated antibodies in electron microscopy. *Internat. Rev. Cytol.* **32**:291-326, 1972.
- Mullinix, K. P.; Rosenkranz, S.; Carr, H. S. and Rosenkranz, Herbert S.
Reaction between DNA and N-hydroxyurethan. *Biochim. Biophys. Acta* **312**:1-13, 1973.
- Rosenberg, Burton J.; Erlanger, Bernard F. and Beiser, Sam M.
Radioimmunochemical studies on nucleoside-specific antibodies using iodinated DNA. *J. Immunol.* **108**: 271-274, 1972.
Specific binding of ribonucleic acid by antiadenosine antibodies. *Biochemistry* **12**: 2191-2197, 1973.
- Rosenkranz, Herbert S.
Hydroxylamine-O-sulfonic acid: *In vitro* and possible *in vivo* reaction with DNA. *Chemico-Biol. Interactions* **7**:195-204, 1973.
- Sodium hypochlorite and sodium perborate: Preferential inhibitors of DNA polymerase deficient bacteria. *Mutation Res.* **21**:171-174, 1973.
RNA in coliphage T5. *Nature* **242**:327-329, 1973.
- Rifampicin and multiple sclerosis. *Lancet* **2**:1370, 1973.
Preferential effect of dichlorvos (Vapona) on bacteria deficient in DNA polymerase. *Cancer Res.* **33**:458-459, 1973.
- Aspects of microbiology in cancer research. *Ann. Rev. Microbiol.* **27**:383-401, 1973.
- Miracil D: Inhibition of deoxyribonucleic acid polymerase-deficient *Escherichia coli*. *Antimicrob. Ag. Chemother.* **3**:530-531, 1973.
- Rosenkranz, Herbert S. and Anerson, Marvin D.
Identification and action of environmental carcinogens. *Hama'abada (J. Israel Biochem. Microbiol. Assoc.)* **1**:70-84, 1973.
- Rosenkranz, Herbert S. and Becker, Yechiel
Reversible inhibition of herpes simplex virus replication by hydroxyurea. *Antimicrob. Ag. Chemother.* **3**:325-331, 1973.
- Rosenkranz, Herbert S. and Carr, Howard S.
Silver sulfadiazine: Effect on the growth and metabolism of bacteria. *Antimicrob. Ag. Chemother.* **2**:367-372, 1972.
- Rosenkranz, Herbert S.; Gutter, Bezalel and Becker, Yechiel
Studies on the developmental cycle of *Chlamydia trachomatis*: Selective inhibition by hydroxyurea. *J. Bact.* **115**:682-690, 1973.
- Rosenbranz, Herbert S. and Rosenkranz, Samuel
Silver sulfadiazine. Interaction with isolated DNA. *Antimicrob. Ag. Chemother.* **2**:373-383, 1972.
- Rovis, Luciana; Anderson, Byron; Kabat, Elvin A.; Gruezo, Flavio and Liao, Jerry.
Heterogeneity of carbohydrate fragments isolated from human blood group H and Le^a active glycoproteins by base-borohydride degradation. *Biochemistry* **12**:1955-1961, 1973.
- Rovis, Luciana; Anderson, Byron; Kabat, Elvin A.; Gruezo, Flavio and Liao, Jerry
Immunochemical studies on blood groups. LVII. Structures of oligosaccharides produced by base-borohydride degradation of human ovarian cyst blood group H, Le^b and Le^a active glycoproteins. *Biochemistry* **12**:5340-5354, 1973.
- Rovis, Luciana; Kabat, Elvin A.; Percira, Miercio and Feizi, Ten
Immunochemical studies on blood groups. LVIII. The activity of reduced oligosaccharides isolated from blood group H, Le^b and Le^a substances by alkaline borohydride degradation. *Biochemistry* **12**:5355-5359, 1973.
- Schreck, Rhona R.; Warburton, Dorothy; Miller, Orlando J.; Beiser, Sam M. and Erlanger, Bernard F.
Chromosome structure as revealed by a combined chemical and immunochemical procedure. *Proc. Nat. Acad. Sc.* **70**:804-807, 1973.

- Tanenbaum, Stuart W.
Effects of cytochalasins on cell division. In: 1973 *McGraw-Hill Yearbook of Science and Technology*, D. N. Lapedes, ed., McGraw-Hill, New York, 1973, p. 127.
- Torii, Mitsuo; Sakakibara, Keiko and Kabat, Elvin A.
Immunochemical studies on dextrans. VII. Further characterization of the combining sites of human and rabbit antidextrans and horse antipneumococcal antibodies by oligosaccharide inhibition studies with trisaccharides of glucose containing $\alpha(1\rightarrow 2)$ and $\alpha(1\rightarrow 6)$ linkages. *J. Immunol.* **110**:951-958, 1973.
- Wainberg, M. A. and Howe, C.
Factors affecting cell fusion induced by Sendai virus. *J. Virol.* **12**:937-939, 1973.
- Wlodkowski, Theodore J. and Rosenkranz, Herbert S.
Antifungal activity of silver sulphadiazine. *Lancet* **2**: 739-740, 1973.
- Wu, Tai Te and Kabat, Elvin A.
An attempt to evaluate the influence of neighboring amino acids ($n-1$) and ($n+1$) on the backbone conformation of amino acid (n) in proteins. Use in predicting the three-dimensional structure of the polypeptide backbone of other proteins. *J. Molec. Biol.* **75**:13-31, 1973.
- Zimmerman, Earl A.; Hsu, Konrad C.; Robinson, Allan G.; Carmel, Peter W.; Frantz, Andrew G. and Tannenbaum, Myron
Studies of neurophysin secreting neurons with immunoperoxidase techniques employing antibody to bovine neurophysin I. Light microscopic findings in monkey and bovine tissues. *Endocrinology* **92**:931-940, 1973.

Neurological Surgery

EDWARD B. SCHLESINGER

Stookey Professor and Chairman • Director of Service

On April 1, 1973, Dr. Lester A. Mount relinquished his responsibilities as Acting Chairman of the Department of Neurological Surgery. The Department gratefully acknowledges his efforts on its behalf and recognizes the mark of excellence with which Dr. Mount endows all his endeavors.

The succeeding chairman, Dr. Edward B. Schlesinger, had the privilege of assuming the Byron Polk Stookey Chair in Neurological Surgery. The chair, honoring the memory of one of our most renowned and gifted teachers, strengthens the Department immeasurably.

The radioisotope scan laboratory under the direction of Dr. Schlesinger, with the able assistance of Drs. W. Jost Michelsen and Joao L. Antunes, continued its diagnostic service to the Hospital. Innovative techniques and continuing review of the unique data collected over several decades have led to better understanding of many important entities, such as the effect of chemotherapy on tumors of the central nervous system (CNS), the prediction of recovery from stroke, and the choice of therapy for various disorders of cerebrospinal fluid production and resorption from the CNS.

Under the Cancer Research Center program, Dr. Schlesinger, with Drs. Michelsen and Ronald Brisman, is carrying out a laboratory study designed to better comprehend the effects of chemotherapy and steroids on CNS tumors.

With EEG studies performed in parallel by Dr. Eli Goldensohn (Neurology), and as part of a national collaborative study, Drs. Schlesinger and Antunes

evaluated a variety of means of establishing cerebral death. This project is significant in view of the accelerating numbers of organ grafting procedures.

Dr. Schlesinger is a member of the Executive Committee of the Neurosurgical Society of America, the National Committee for Standardization of Neurosurgical Implants, and the Editorial Committee of the Collaborative Study on Cerebral Death. During the year he was elected to the Board of Trustees of the William J. Matheson Foundation and served as a guest examiner of the American Board of Neurological Surgery. With Drs. Antunes and Michelsen he presented a paper at the annual meeting of the American Association of Neurological Surgeons entitled "Value of Sequential Scanning in the Detection of Metastatic Tumors."

Dr. Lester A. Mount continues to serve as a member of the Board of Directors of the American Association of Neurological Surgery and Chairman of the Foreign Neurosurgery Training Committee of the American Association of Neurological Surgeons. He is Chairman of the Hope Committee of the Neurosurgical Society of America and a member of the Medical Board of Project Hope and Chief of its Neurosurgical Section. He is engaged in the vital work of the Residency Review Committee for Neurosurgery and continues as First Vice President of the Foundation for International Education in Neurosurgery. In October 1973, Dr. Mount was guest lecturer at the Congress of Neurological Surgery and with Dr. Brisman read a paper on the "Treatment of Multiple Intracranial Aneurysms." With Dr.

Martin B. Camins he presented a paper entitled "Primary Suprasellar Atypical Teratomas" at the annual meeting of the American Association of Neurological Surgeons.

Dr. James W. Correll continued his study of occlusive cerebral vascular disease. The contribution of surgery to treatment of this condition has been increasingly well understood. With members of the Division of Neuroradiology, Dr. Correll is evaluating the use of various neuroradiological techniques, including those based on thermography and Doppler ultrasonics. His significant investigation of the influence of the nervous system on lipid metabolism continues. Additional information concerning a newly defined and important autonomic function of the CNS was obtained in his laboratory. Dr. Correll also started a project on the pathophysiology and treatment of convulsive disorders with Dr. James Finn and Professor Goldensohn. Dr. Correll read a paper entitled "Influence of the Nervous System on Lipid Metabolism" at the meeting of the Research Society of Neurological Surgery and at the annual meeting of the American Academy of Neurological Surgery, a paper entitled "Activation of the Extracranial Carotid Atherosclerotic Lesion."

Dr. Edgar M. Housepian, under the auspices of the American Cancer Society and the Columbia-Presbyterian Cancer Research Center, continued clinical experimental studies in brain tumor chemotherapy. His organizational and clinical skills are reflected in the present level of excellence of this important project, and in the recruitment of Dr. Ronald Brisman as full-time project director. His interest in, and contributions to, audiovisual educational techniques have given not only the Department but the entire Medical Center an important impetus in a vital teaching area. Dr. Housepian serves as an officer of the New York State Neurosurgical Society and a member of its Peer Review Committee.

Dr. James G. McMurtry read a paper entitled "Elective Circulatory Arrest with Thoracotomy in the Treatment of Twelve Cases of Basilar Artery Aneurysm" at the annual meeting of the Neurosurgical Society of America in June 1973. With Drs. Frederick O. Bowman (Surgery) and Richard S. Matteo (Anesthesiology), he is developing improved operative techniques and patient care in this difficult field of neurological surgery. His publication, *Medical Examination in Neurosurgery*, has proved a most useful review text.

Dr. Thomas J. Bridges continued to act as Department representative to the Francis Delafield Hospi-

tal. His primary interest in the management of pain continues, and the Department is in great debt to him for his meticulous and careful evaluation of novel techniques for pain relief.

Dr. Peter W. Carmel continued his exacting and fruitful studies of hypothalamic regulation of pituitary function with Drs. Earl A. Zimmerman and Michele Ferin (International Institute for the Study of Human Reproduction). His work is not only of fundamental importance in understanding complex and vital neuroendocrine mechanisms but has a direct bearing on effective therapy of significant numbers of patients with disorders of the endocrine and neurological systems.

Dr. W. Jost Michelsen with Dr. Sadek Hilal (Neuroradiology) is studying the usefulness of embolization in the treatment of vascular disorders of the nervous system. A paper entitled "Changes in Cerebral Blood Flow Before and After Percutaneous Embolization of Arteriovenous Malformations" was read at the American Association of Neurological Surgeons' meeting. His services to the Brain Localization Laboratory are invaluable. With Drs. Schlesinger and Brisman he is participating in laboratory studies on the mechanism of isotope uptake in brain tumors exposed to a variety of chemotherapeutic agents.

Dr. Ronald Brisman assumed direction of the Cancer Chemotherapy Project and entered into research activity with other members of the Department. His abilities and diligence make him a welcome addition.

The resident staff has been increasingly involved in research and publication activities. Dr. Joao L. Antunes has proved an invaluable colleague in the Brain Scan Laboratories. Dr. Michael Salzman has set up a neurophysiological laboratory utilizing a micro-electrode technique of his own design.

Mr. L. Dade Lunsford of the fourth-year medical class has been studying isotope concentration in cerebrospinal fluid in a variety of neurological disorders under the direction of Dr. Schlesinger.

A paramount interest in, and awareness of, the primary importance of patient care has led the Department to embark on a novel plan, incorporating nursing skills directly into the departmental structure. Ms. Sharon L. Sawitzke, formerly a Head Nurse at the Neurological Institute, became our first Neurosurgical Nurse Specialist. Her primary responsibility is to serve as the patients' advocate and ombudsman in the area of neurosurgical nursing care. She has proved invaluable in improving the sensitivity of our responses to our patients' total

needs, and gives personal expression, in a most welcome manner, of the Department's desire to deliver the best of individual care.

A major effort was devoted to revision of the Department's teaching program, both undergraduate and on various graduate levels, including Nursing. The urgent need for continuing graduate education, coupled with a unique partnership with the Division of Audiovisual Services (largely through the efforts of Dr. Housepian), has led to a program designed to accept a much enlarged concept of our departmental responsibility in graduate neurosurgi-

cal education. Drs. Carmel, Housepian, and Michelsen of the Committee on Teaching deserve special mention for their efforts in our educational program.

Excellence in patient care, meticulous preparation of the student for his future role, and the furtherance of neurosurgical knowledge form the triad of our departmental goals. The chairman must commend his departmental colleagues who, under trying conditions and burgeoning demands upon their time and skills, have responded with all possible spirit and energy.

1973 Publications

Neurological Surgery

Brisman, Ronald

Endocrine studies with empty sella. *J. Neurosurg.* **38**:537, 1973.

Brisman, Ronald and Mendell, Gerald

Brain tumors and thromboembolic disease. *J. Neurosurg.* **38**:337-338, 1973.

Brisman, Ronald; Schneider, Sanford and Carter, Sidney
Subarachnoid infusion and shunt function. *J. Neurosurg.* **38**:379-381, 1973.

Mount, Lester A.

Intracranial arterial aneurysms. In: *Practice of Surgery, Neurological Surgery*. Chapter 16. Harper & Row, Hagerstown, Md., 1973.

Zimmerman, Earl A.; Hsu, Konrad C.; Robinson, Alan G.; Carmel, Peter W.; Frantz, Andrew G. and

Tannenbaum, Myron

Studies of neurophysin secreting neurons with immunoperoxidase techniques employing antibody to bovine neurophysin I. Light microscopic findings in monkey and bovine tissues. *Endocrinology* **92**:931-940, 1973.

Neurology

LEWIS P. ROWLAND

Professor and Chairman of the Department • Director of Service

Teaching

Changes in Staff

Dr. Richard L. Masland, Moses Professor of Neurology, resigned as Chairman of the Department, and Dr. Lewis P. Rowland was appointed as Professor and Chairman. Dr. Sidney Carter, Dwight D. Eisenhower-United Cerebral Palsy Professor, spent six months on sabbatical leave at Guy's Hospital, London, England. Dr. Donald H. Harter, Professor of Neurology and Microbiology, was on sabbatical leave at Queen's College, Cambridge, England. Dr. Ralph W. Richter's title was changed to Associate Professor of Clinical Neurology (at Harlem Hospital) and Dr. M. Richard Koenigsberger's title was changed to Assistant Professor of Neurology and Pediatrics. Dr. George M. Katz was promoted to Senior Research Associate, and Dr. Carl W. Braun (at St. Luke's Hospital) and Dr. Bertel Bruun (at Harlem Hospital), to Associates in Clinical Neurology. New members of the department are: Professor: Dr. Stanley Fahn; Associate Professor: Dr. Audrey S. Penn; Assistant Professor of Clinical Neurology: Dr. William P. Isgreen; Associate in Clinical Neurology: Dr. Stanley B. Holstein; Instructor in Clinical Neurology: Drs. Sidney Bender (at St. Luke's Hospital), V. John Blazina, Sarala A. Devi; Research Associate: Drs. Shiro Mawatari, Mark G. McNamee, Charles R. Plank, A. L. N. Prasad, and Martha M. Sorenson.

Dr. Melvin D. Yahr, H. Houston Merritt Professor, resigned to become Chairman of Neurology at the Mount Sinai School of Medicine. Drs. Roger C.

Duvoisin, Professor, Soll Berl, Associate Professor, Myrna J. Schear and Florry P. Bowen, Assistant Professors, Drs. Richard E. Heikkila and William Nicklas, Research Associates, Dr. Canagasoorian Mahendran, Assistant, also accepted positions at Mt. Sinai School of Medicine. Dr. Arnold P. Friedman, Clinical Professor, accepted a similar position at the University of Arizona at Tucson but will continue his research on headache here and will serve as Lecturer. Dr. Luis Marco, Assistant Professor, resigned to go into private practice. Dr. Philip Su, Instructor, resigned to accept a position at the State University of New York at Stony Brook. Dr. Nachum Dafny became Assistant Professor at the University of Texas and Dr. Frances M. Dyro, an Assistant Professor at the University of Maine.

The Lucy B. Moses Prize in Clinical Neurology was awarded to Dr. Arnold P. Friedman for his paper on "Headache in History, Literature and Legend" as it epitomizes the breadth of view which has characterized his lifelong concern for this most common and debilitating disorder. The Lucy B. Moses Prize in Basic Neurology was awarded to Dr. Sid Gilman for his series of paper dealing with mechanisms for the regulation of voluntary movement. Dr. Gilman was elected to membership in the American Society of Clinical Investigation. Dr. Earl A. Zimmerman was honored by a Teacher-Investigator Award from the N.I.H. Dr. Eli S. Goldensohn was appointed to the Board of Scientific Counselors of the National Institute of Neurological Diseases and Stroke; he was Visiting Neurologist at the Sygehus in Vejil, Den-

mark for the month of August 1973 and was on the Council of the American Electroencephalographic Society and on the Board of Directors of the American Board of Registration of Electroencephalographic Technologists. The Presbyterian Hospital School of EEG Technology, directed by Dr. Goldensohn, with the assistance of Miss Carol Christensen (Supervisor, EEG Department), graduated its first class. Dr. Ralph W. Richter served as Consultant to the Joint Committee for Stroke Facilities. Dr. David Nachmansohn was elected to the Board of Governors of the Weizmann Institute and to the Board of Editors of the *Annual Review of Biochemistry*. Dr. Lewis P. Rowland was Secretary-Treasurer of the Association of University Professors of Neurology, Chairman of the Medical Advisory Board of the Myasthenia Gravis Foundation, an Editor of the *Archives of Neurology* and a member of the Advisory Board of the Muscular Dystrophy Associations of America and of the Multiple Sclerosis Society. Drs. Rowland and Stanley Fahn served on the Committee to Combat Huntington's Disease. Drs. Audrey S. Penn and Abe M. Chutorian were elected to membership in the American Neurological Association.

Research

Diseases of the Central Nervous System

The Parkinsonism Research Group was reorganized under the direction of Dr. Stanley Fahn. With Dr. A. L. N. Prasad, Dr. Fahn developed semiautomated methods for measuring L-dopa and its metabolites. They were able to follow the changes in the concentration of this drug and related compounds after the administration of carbidopa, an inhibitor of the enzyme that inactivates L-dopa. They also developed procedures to measure all the biogenic amines, their precursors, and metabolites in a single sample. Clinical drug evaluations were initiated with Dr. William P. Isgreen.

Dr. Donald H. Harter and associates investigated the relationship of visna virus to multiple sclerosis, using the techniques of molecular hybridization and simultaneous detection. With Drs. Friedman, J. E. Coward, and Councilman Morgan (Microbiology), electron microscopic studies were performed which indicated that the visna virus genome consists of a single stranded molecule. RNA, amino acid, and polyamine composition were analyzed with Drs. Purnell Choppin and Walter Mountcastle (Rockefeller University) and Leon T. Kremzner. In collaboration with Dr. Harter, Drs. Yahr, Herbert Barden, Philip E. Duffy, Abner Wolf (Pathology), Konrad C. Hus (Microbiology), and Eugenia T. Gamboa

found immunofluorescence evidence of influenza virus in the brains of patients with postencephalitic parkinsonism. A tissue culture laboratory was established by Drs. Harter, Gamboa, and William Whetsell (Pathology) to study the effects of influenza virus on neural tissues.

With Dr. Sid Gilman, Drs. Paula Copack, James A. Lieberman, and Luis Marco studied mechanisms controlling muscle tone. They evaluated responses to stretch of muscle spindles after experimental lesions in cerebral cortex and ventrolateral nucleus of thalamus. Depression of spindle responses correlated with hypotonia of the limbs, suggesting a causal relationship. Drs. Copack, Gilman, and Lieberman recorded the responses of single alpha motoneurons to natural stimuli in an animal model of limb rigidity. Responses were enhanced when vestibular or joint proprioceptive stimuli were used, but not after other types of stimuli. The "release" mechanisms underlying rigidity of the limbs in these animal models were highly specific and stimulus-bound. Drs. Copack and Gilman found evidence of vestibular input to several nuclei of thalamus and to caudate nucleus, putamen, and globus pallidus, a pathway anatomically separate from the auditory connections in the brain stem. Drs. Copack, Alan Edelson, Gilman, and Marco studied the intrinsic connections of the caudate nucleus with microelectrode recordings, intracellularly and extracellularly to evaluate the role of this structure. They found evidence of spontaneous activity within this nucleus; the characteristic responses were not altered by experimental procedures that isolated the caudate from other cerebral structures. Drs. Nachum Dafny, George Dauth (Fellows), and Gilman studied unit activity in hypothalamus and basal ganglia of awake and lightly anesthetized rats. It was possible to record from the same element for an entire day. Unit activity was modified by corticosteroids as well as natural physiological stimuli. Potentials evoked by auditory stimuli changed markedly in amplitude following administration of L-dopa and reserpine; but the direction of change was opposite to that expected if dopamine were an inhibitory transmitter in the basal ganglia and if reserpine counteracts the effects of dopamine. The final effects of L-dopa and reserpine may be opposite to effects expected by others. Dr. Gilman, with Dr. Irving S. Cooper (St. Barnabas Hospital), also investigated the therapeutic effects of chronic cerebellar stimulation in patients with intractable epilepsy.

Dr. Virginia M. Tennyson (Pathology) studied the earliest development of substantia nigra and the outgrowth of axons from this structure to the other parts of the basal ganglia by fluorescence and electron mi-

scopy, in attempts to understand the basic mechanisms of parkinsonism and other movement disorders. Dr. Tennyson also studied the role of false transmitters in the sympathetic nerves of the pineal gland, a problem of importance in alcoholism as well as movement disorders. With Dr. Kremzner, Dr. Tennyson showed that acetylcholinesterase activity in developing rabbit muscle is in the sarcoplasmic reticulum in myotubes as well as in mononuclear cells. The mononuclear cells may play an important role in the fusion of myoblasts to form mature muscle. She has also continued her studies on the development of sympathetic ganglia in embryos.

Neuroendocrinology

Dr. Earl A. Zimmerman has been studying hypothalamic mechanisms which influence pituitary function. Using the immunoperoxidase technique and radioimmunoassays, it was found that vasopressin and its carrier protein, neurophysin, are secreted into the hypophyseal portal system in high concentrations. A normal releasing factor role for posterior pituitary peptides in anterior pituitary function was suggested. Clinical studies of the use of vasopressin in the evaluation of patients with pituitary disease are being carried out with Dr. Leon Weisberg (Fellow).

Under the sponsorship of the International Institute for The Study of Human Reproduction, Dr. Zimmerman with Drs. Michel Ferin (Physiology) and Peter W. Carmel (Neurological Surgery) investigated estrogen-sensitive hypothalamic feedback sites on gonadotropins, and the secretory pathways of gonadotropin releasing hormone. A clinicopathological study of growth hormone and prolactin in 21 patients with pituitary adenomas was completed in association with Drs. Andrew G. Frantz (Medicine) and Richard F. Defendini (Pathology). Prolactin was secreted by one third of pituitary adenomas, even without sellar enlargement, indicating the value of plasma prolactin determination in evaluating patients for the presence and activity of pituitary tumor.

Epilepsy

Dr. Eli S. Goldensohn, Mr. Leonard Zablow, and Mr. Alfred Salazar (Research Assistant) are completing a study involving a three-dimensional analysis of the distribution of a small epileptogenic focus produced by penicillin, both by intracellular and extracellular means. Dr. Goldensohn, Mr. Zablow, and Drs. James W. Correll (Neurological Surgery) and James Finn (Neurological Surgery) continued studies on the characteristics of normal and epileptiform activity in single cells of cerebral cortex. They studied the distribution of epileptiform electrical dis-

charges from human cortex. Dr. Goldensohn and Mr. Zablow, with Drs. V. John Blazina and Dora Schively, are studying the effect of anticonvulsant medications on cell characteristics and potential distribution of experimentally produced epileptiform discharges. Drs. Goldensohn and Edward B. Schlesinger (Neurological Surgery) completed the first phase of a national study on brain survival as measured by the electroencephalogram and brain scan in patients who are unconscious and unable to breathe spontaneously. Drs. Sang C. Rhee and Goldensohn studied the electroencephalographic characteristics of deep and superficial intracerebral mass lesions. Drs. Charles E. Pippenger and Goldensohn are correlating electroencephalographic seizure discharges, clinical seizures, and anticonvulsant drug levels on patients being monitored continuously over 24-hour periods.

Muscle Disease

Research in muscle disease was reorganized under the direction of Dr. Rowland. With Drs. Shiro Mawatari and Akio Takagi (University of Tokyo), it was shown that responses of adenyl cyclase to epinephrine and sodium fluoride are defective in muscles of patients with two forms of muscular dystrophy but not in other muscle diseases. The implications and mechanism of this abnormality are currently being studied by Dr. Stanley Holstein. Dr. Audrey S. Penn has been studying the characteristics of muscle proteins in normal and dystrophic muscle and has initiated studies of the acetylcholine receptor in human muscle. She is also participating in immunological studies of thymocytes in myasthenia gravis. Dr. Salvatore DiMauro has been studying biochemical functions of mitochondria in congenital myopathies and discovered a new cause of myoglobinuria, lack of carnitine palmityl transferase.

Dr. Robert E. Lovelace, with Dr. Laurence Carnay (Resident), studied the effects of veratrine and diphenylhydantoin on frog muscle membrane and neuromuscular junction. Dr. Lovelace continued his studies of the morphology and electrophysiology of neuromuscular synapses developing in cultures of spinal cord and muscle. He has also been studying the physiology of mouse diaphragm by microelectrodes in attempts to evaluate the effects of diphenylhydantoin. With Dr. Sarah Bunday (Fellow), Dr. Lovelace analyzed a series of patients with juvenile spinal muscular atrophy simulating muscular dystrophy (Kugelberg-Welander syndrome), demonstrating two distinct genetic entities in relation to age and onset.

Pediatric Neurology

Activities of the Division of Pediatric Neurology continued under the direction of Dr. Sidney Carter. With Dr. Abe M. Chutorian, Dr. Carter studied the effects of caffeine, methyl phenidate, and a placebo on hyperkinetic children. Dr. Chutorian studied paroxysmal torticollis of infancy, idiopathic oculomotor nerve palsy in children, diphenylhydantoin in the treatment of vascular headache, and, with Miss Letty Pogul (Psychiatry), the effects of whole-head radiotherapy on psychological functions.

Drs. M. Richard Koenigsberger and Elizabeth Lell (Fellow) perfected a rotating apparatus to measure nystagmus in newborns by means of electronystagmography and motion pictures, and are now studying vestibular function in high-risk babies. With Dr. Carmella Tardo (Fellow), Dr. Koenigsberger and John Driscoll (Pediatrics) continued to evaluate 150 high-risk infants treated for asphyxia or respiratory distress in the Newborn Nursery. After a period on artificial ventilators these children do well subsequently.

Dr. Edward J. Hart continued as Director of the Readiness Nursery Program, a preschool unit operated jointly with New York City Board of Education to serve disadvantaged children with neurologically based deviations in behavior, language developments and learning abilities. He participated in the establishment of a Dyslexia Clinic in the Presbyterian Hospital and will be its Director.

Dr. Patricia Crumrine (Fellow) compared the two-cell flashlight and the 500-watt electric lamp as means of transilluminating the infant's skull. She found no evidence of increased incidence of tuberous sclerosis among children with retinoblastoma. Dr. Crumrine participated in a study of chemotherapy of solid intracranial tumors of children, a project performed in conjunction with the program of the adult chemotherapy group to assess the effectiveness of various nitrosurea drugs in treating brain tumors.

Harlem Hospital

The Harlem Regional Stroke Program was directed by Dr. Ralph W. Richter. With Drs. Bertel Bruun, Stroke Unit Director, and Stephen Shafer (Fellow), Dr. Richter completed studies on the epidemiology of stroke in central Harlem, hypertension, and intracranial hemorrhage, and the influence of associated diseases on acute stroke. Studies on aphasic disturbances in stroke were conducted by Drs. John C. M. Brust and Shafer. Dr. Alfred Bannerman is reviewing seizure disorders related to stroke.

Clinical, pathological, toxicological, and epidemi-

ological studies were conducted in conjunction with the Office of the Chief Medical Examiner of New York City. Drs. Yasoma B. Challenor, Richter, and Bruun completed studies on plexitis related to heroin addiction. The evaluation and treatment of patients with drug overdose were studied by Dr. Schively. Drs. Brust and Richter finished studies of tetanus management in heroin addicts. The effects of street heroin in baboons were studied by Drs. Lee Reichman (Medicine), Chiang Shim (Albert Einstein School of Medicine), Michael M. Baden (Office of the Chief Medical Examiner), and Richter. Dr. Lawrence Levine (Brandeis University) collaborated in radioimmunoassay studies of drugs of abuse and antibody formation to them.

Neurosciences

Dr. Fred A. Mettler continued his work on the pathophysiology of abnormal movements. He refined the impression that removal of the rostroventral portion of the striatum produces a specific type of hyperkinesia, driven by proprioceptive stimulation. One critical possibility was eliminated. In cases (human as well as simian and infraprimate) of obstinate progression, ventricular hemorrhage often is present, and the physiologic phenomenon might result from irritation. However, one of his cases, in which he removed almost all of the striatum by a ventral approach without breaking the ependyma or having such hemorrhage, proved that the syndrome can develop in the absence of intraventricular hemorrhage. The animal survived through the acute phase of obstinate progression into a chronic condition. It subsequently manifested a flexed posture and tremor. There was no damage caudal to the anterior commissure but the proximity of the putamenal removal to the most rostral part of the pallidum resulted in pallidal gliosis. Pallidal cytoplasmic components were well preserved. Dr. Mettler also continued his studies of the movement disorder induced by azide and cerebellar connections in primates.

Dr. John P. Reuben became Director of the Laboratory of Neurophysiology. Professor Emeritus Harry Grundfest continued to serve as consultant. With Dr. Philip W. Brandt (Anatomy), and Dr. Morton Orentlicher, they studied the regulation of the interaction between actin and myosin in skin muscle fibers. With Dr. Martha M. Sorenson, Dr. Reuben studied the interaction of actin and myosin, as regulated by MgATP and calcium in extracted myofibrils. With Dr. M. Joan Dawson (Fellow), they studied calcium regulation by surface and sarcolemmal membranes of muscle. With Dr. George M. Katz and Drs. Abraham B. Eastwood III and Jenny

Zollman (Fellows), they studied the electrical and physical properties of the transverse tubular system of muscle. With Dr. Masataki Kawai, they studied the mechanical properties of intact and skinned muscle fibers. They also initiated studies of a physiological basis of weakness in human muscle from patients with muscular dystrophy.

Dr. Arthur Karlin studied the chemical and physical properties and mechanisms of action of the receptor for acetylcholine in intact cells, subcellular membrane fragments, and solubilized and purified preparations. With Mr. Allen Hirsh (Graduate Student), he obtained evidence that the receptor will not conduct sodium ions outward. Drs. David Cowburn and Karlin developed a convenient, sensitive assay for the solubilized acetylcholine receptor; the method combines the specificities of affinity-labeling and of snake neurotoxin-binding. Milligram quantities of the receptor were purified by affinity chromatography. The rate of the affinity reaction of the purified receptor was identical to that of receptor in intact cells (electroplax) and in subcellular membrane vesicles. Thus, one criterion was fulfilled for the preservation of the native conformation of the receptor in its transition from the cell to the isolated state. Dr. Kremzner collaborated in analyzing the amino acid composition of the receptor.

The purified receptor was found to contain three major polypeptide components by SDS-gel electrophoresis; however, only one of these, of molecular weight 40,000, was affinity-labeled and seems to contain all or part of the acetylcholine binding site. The functions of the other putative receptor subunits are unknown. In nonionic detergent, the receptor is contained within an aggregate of size greater than that of β -galactosidase. Dr. Mark McNamee prepared membrane vesicles responsive to acetylcholine and made preliminary steps in the direction of the reconstitution of membrane vesicles from purified receptor and other membrane components. With Drs. Alan Finkelstein and Robert Muller (Albert Einstein College of Medicine), this work is being extended to the incorporation of receptor into artificial phospholipid films. Dr. Israel Silman (Hebrew University) returned to investigate the mechanisms of presynaptic release of acetylcholine for extended periods. The ionophoric antibiotics were shown to be useful probes into the mechanisms of release, particularly into the separate effects on terminals of depolarization and of changes in internal ion composition.

Investigators in the Neurochemistry Laboratory continued to investigate the biochemical properties of proteins in excitable membranes of electric eel tissue. Dr. Terrone L. Rosenberry became leader of the

group, with Dr. Hai Won Chang as investigator, and Professor Emeritus Dr. David Nachmansohn as consultant.

The chemical structure of acetylcholinesterase was further elucidated by Drs. Rosenberry and Hueh-tsun Chen and Ernest Bock (Research Worker). This enzyme had previously been purified by affinity chromatography techniques developed in this laboratory. Current results show the enzyme to be a tetramer of identical catalytic subunits subject to proteolytic cleavage at two discrete points. Immunochemical studies were initiated using antibody to this purified enzyme. Purification of the acetylcholine receptor was successfully pursued by Dr. Chang. The ligand binding properties and the functional role of free sulfhydryl groups are currently being investigated. The site of action of veratridine was shown to involve the excitable Na^+ ion pathway in both the synaptic and conducting membranes of the intact electroplax cell in work by Dr. William D. Niemi. Current efforts are directed toward the roles of veratridine and calcium in controlling ion conductances in the excitable membrane. Dr. Nachmansohn, with the late Professor Aharon Katchalsky and Dr. Eberhard Neumann (Weizmann Institute) elaborated an integral model of nerve excitability.

Patient Care

More than 15,000 visits were completed this year in the Department's clinics. Specialized services are provided for muscle disease, seizures, clinical drug research, parkinsonism, and pediatric neurology. A clinical psychologist, Dr. Helaine Gold, has been appointed specifically for testing patients with seizure disorders. The clinic facilities have been improved with the help of the Neurological Institute Auxiliary. There were 11,894 visits to Doctors' Private Offices. There were 1,507 ward admissions and 2,835 semi-private admissions. The electroencephalographic laboratory under Dr. Goldensohn increased its output to approximately 8,500 examinations this year. The clinical electromyographic laboratory, under the direction of Dr. Lovelace, did 1,394 examinations during the year. In all, 2,744 anticonvulsant blood levels were tested in the clinical pharmacology laboratory directed by Dr. Pippenger.

Acknowledgments

The Department of Neurology gratefully acknowledges research support from the Beck Foundation, Beecham-Massengill Pharmaceuticals, William Black Endowment Fund, Ciba-Geigy Pharmaceuticals, Dreyfus Charitable Foundation, Easter Seal Research Foundation, Mrs. Marian K. Frelinghuysen,

The Belle Fisher Chapter of Big E, Mrs. Katherine Graham, Bert C. and Ruth M. Goss Memorial Fund, Mr. David Hartfield, Jr., John W. Hill Foundation, Hoffman-LaRoche Foundation, Hoyt Foundation, Mr. and Mrs. John Indiveri, Rev. and Mrs. David R. King, Robert Lehman Foundation, Inc., Merck & Co., Inc., Mrs. Lucy G. Moses, Muscular Dystrophy Associations of America, National Science Founda-

tion, New York Heart Association, New York Metropolitan Regional Disease Foundation, Walter Palmer Memorial Fund, Parkinson's Disease Foundation, Inc., Stony Wold Foundation, United Cerebral Palsy Research and Education Foundation, United States Public Health Service (National Institute of Neurological Diseases and Stroke), Miles Hodson Vernon Foundation, and Mrs. Elizabeth G. Weymouth.

1973 Publications

Neurology

August, M. and Harter, D. H.

Visna-virus-induced fusion of continuous simian kidney cells (Abstract). *Ann. Meeting, Am. Soc. Microbiol.* 1973, p. 212.

Bartels, E. and Rosenberry, T. L.

Modification of electroplax excitability by veratridine. *Biochem. Biophys. Acta* 298:973-985, 1973.

Black, J. T.; Brait, K. A.; deJesus, P. V.;

Harner, R. N. and Rowland, L. P.

Myasthenia gravis lacking response to cholinergic drugs. *Neurology* 23:851-853, 1973.

Bock, E.; Chen, Y-t. and Rosenberry, T. L.

Subunit structure of acetylcholinesterase. *Fed. Proc.* 32:510, 1973.

Brait, K.; Fahn, S. and Schwarz, G. A.

Sporadic and familial parkinsonism and motor neuron disease. *Neurology* 23:990-1002, 1973.

Brown, D. G. and Goldensohn, E. S.

The electroencephalogram in normal pressure hydrocephalus. *Arch. Neurol.* 29:70-71, 1973.

Bruun, B. and Richter, R. W.

Strokes in an inner city community (Abstract). *Circulation* 66:48, 1972.

The epidemiology of stroke in central Harlem. *Stroke* 4:406-408, 1973.

Carter, S. and Gold, A. P.

Contributions to section on neurology. In: *Pediatrics*, 15th ed. H. L. Barnett, ed. Appleton-Century-Croft, New York, 1972.

Challenor, Y. G.; Richter, R. W. and Bruun, B.

Non-traumatic plexitis associated with heroin addiction. *J.A.M.A.* 225:958-961, 1973.

Chen, Y-t.; Rosenberry, T. L. and Chang, H. W.

Direct purification of multiple molecular forms of acetylcholinesterase from fresh electric tissue via affinity chromatography. *Fed. Proc.* 32:554, 1973.

Chutorian, A. M.

Chapters on brain tumors and spinal cord tumors in childhood. In: *Pediatrics*, 15th ed. H. L. Barnett, ed. Appleton-Century-Croft, New York, 1972.

Cooper, I. S. and Gilman, S.

Chronic stimulation of the cerebellar cortex in the therapy of epilepsy in the human. In: *Neural Organization and Its Relevance to Prosthetics*. W. S. Fields, ed. Intercontinental Book Corp., New York, 1973.

Copack, P.; Dafny, N. and Gilman, S.

Neurophysiological evidence of vestibular projections to thalamus, basal ganglia and cerebral cortex. In: *Corticothalamic Projections and Sensorimotor Activities*. T. L. Frigyesi, E. Rinvik and M. D. Yahr, ed. Raven Press, New York, 1972.

Copack, P.; Lieberman, J. S. and Gilman, S.

Alpha motoneuron responses to natural stimuli in experimental hypertonia. *Trans. Am. Neurol. A.* 97: 112-115, 1972.

Coward, J. E.; Harter, D. H.; Hsu, K. C. and Morgan, C. Ferritin-conjugated labeling of visna virus. *Virology* 50:925-930, 1972.

Dafny, N. and Gilman, S.

Characterization of single unit activity in hypothalamus and reticular formation recorded with semi-microelectrodes. *Brain Res.* 59:243-255, 1973.

Effects of L-dopa and reserpine on evoked responses from basal ganglia of freely behaving rats (Abstract). *Soc. Neurosciences* 1972, p. 129.

L-dopa and reserpine: Effects on evoked potentials in basal ganglia of freely moving rats. *Brain Res.* 50: 187-191, 1973.

Dafny, N.; Phillips, M. I.; Taylor, A. N. and Gilman, S.

Dose effects of cortisol on single unit activity in hypothalamus, reticular formation, and hippocampus of freely behaving rats correlated with plasma steroid levels. *Brain Res.* 59:257-272, 1973.

Dauth, G.; Dafny, N.; Marco, L.; Glusman, M. and Gilman, S.

Modification of unit activity in hypothalamus and reticular formation by sensory and central stimulation (Abstract). *Soc. Neurosciences* 187, 1972.

DeJesus, P. V.; Slater, R. S.; Spitz, L. K.;

Stemmler, E. J. and Penn, A. S.

Neuromuscular physiology of wound botulism. *Arch. Neurol.* 29:425-431, 1973.

DiMauro, S.; Rowland, L. P. and Mellman, W. J.

Glycogen metabolism of human diploid fibroblast cells in culture. I. Studies of cells from patients with glycoses Type II, III, and V. *Pediat. Res.* 7:739-744, 1973.

- DiMauro, S.; Scott, C.; Penn, A. S. and Rowland, L. P.
Serum carnitine: An index of muscle destruction in man. *Arch. Neurol.* 1973, pp. 186-190.
- DiMauro, S.; Schotland, D. L.; Bonilla, E.; Lee, C. P.; Gambetti, P. and Rowland, L. P.
Progressive ophthalmoplegia, glycogen storage, and abnormal mitochondria. *Arch. Neurol.* 29:170-179, 1973.
- Duffy, P. E.; Wolf, A.; Harter, D. H.; Gamboa, E. T. and Hsu, K. C.
Murine influenza virus encephalomyelitis. II. Electron microscopic observations. *J. Neuropath. & Exper. Neurol.* 32:72-91, 1973.
- Eastwood, A. B. III and Reuben, J. P.
Modification of E-C coupling by D₂O. *J. Gen. Physiol.* 61:246, 1973.
- Eastwood, A. B. III; Zollman, J.; Katz, G. J. and Reuben, J. P.
Disruption of the TTS in crayfish muscle fibers (Abstract). *Fed. Proc.* 32:373, 1973.
- Ebel, H. C.; Gilman, S. and Marco, L. A.
Analysis of neural unit-data: Effect of threshold upon average response frequency. *Brain Res.* 44:265-270, 1972.
- Fahn, S.; Mishkin, M. M. and Hoffman, R. R.
Pharmacologic and radiologic investigations in Huntington's chorea. *Adv. Neurol.* 1:581-597, 1973.
- Gamboa, E. T. and Harter, D. H.
Effect of incomplete virus particles on experimental murine encephalitis. *Trans. Am. Neurol. A.* 97:287, 1972.
- Gilman, S.
Significance of muscle receptor control systems in the pathophysiology of experimental postural abnormalities. In: *New Developments in Electromyography and Clinical Neurophysiology*. J. E. Desmedt, ed. Karger, Basel, 1973.
- Gilman, S. and Barrett, R. E.
Hallervorden-Spatz disease and infantile neuroaxonal dystrophy: Clinical characteristics and nosological considerations. *J. Neurol. Sc.* 19:189-205, 1973.
- Gilman, S.; Copack, P. and Lieberman, J. S.
Gamma and alpha motoneuron responses in experimental hypertonia. In: *Functional Neuromuscular Stimulation*. National Academy of Sciences, Washington, D. C., 1972.
- Gilman, S.; Lieberman, J. S. and Copack, P.
A thalamic mechanism of postural control. *Internat. J. Neurol.* 8:260-275, 1971.
- Gold, A. P.
Cerebral arteriovenous malformation. *Devel. Med. Child Neurol.* 15:84, 1973.
- Goldensohn, E. S.
Audio-visual analysis of clinical EEG relationships in unusual manifestations of seizures. *EEG & Clin. Neurophysiol.* 34:790, 1973.
- Grundfest, H.
N-shaped characteristics in living membrane. In: *Perspectives in Membrane Biophysics*. D. P. Agin, ed. Gordon & Breach, London, 1972.
- Neuromuscular transmission in arthropods. In: *Neuromuscular Blocking and Stimulating Agents*. J. Cheymol, ed. Pergamon Press, London, 1972.
- Hammill, J. F.
Trauma to the nervous system. In: *Pediatrics*. H. L. Barnett, ed. Appleton-Century-Croft, New York, 1972.
- Harter, D. H.
Virus infections. In: *A Textbook of Neurology*, 5th ed. H. H. Merritt, ed. Lea & Febiger, Philadelphia, 1973.
- Harter, D. H.; Axel, R.; Burny, A.; Gulati, S.; Schlom, J. and Spiegelman, S.
The relationship of visna, maedi and RNA tumor viruses as studied by molecular hybridization. *Virology* 52:287-291, 1973.
- Herman, M. A. and Pippenger, C. E.
Anticonvulsant-induced osteomalacia: Relationship to serum drug levels (Abstract). *Neurology* 23:437, 1973.
- Heurich, A.; Brust, J. C. M. and Richter, R. W.
Management of urban tetanus. *Med. Clin. North America* 57:1373-1381, 1973.
- Karlin, A.
Molecular interactions of the acetylcholine receptor. ASPET Symposium on Membranes and Mechanisms of Hormone Action. *Fed. Proc.* 32:1847-1853, 1973.
- Molecular aspects of the acetylcholine receptor. *Fifth Int. Cong. Pharmacol. Symposium on Cholinergic Receptor Mechanisms*. S. Karger, Basel, 5:86-97, 1973.
- Katz, G. M. and Freeman, A. R.
The scatter of intracellular ionic concentration in the lobster circumesophageal axon. *J. Comp. Physiol.* 81:89-98, 1972.
- Kawai, M.
Stiffness measurement of skinned muscle fibers at low frequency. *Biol. Bull.* 143:406, 1972.
- Kawai, M. and Brandt, P. W.
Resting stiffness and tension of stretched crayfish muscle fibers (Abstract). *Fed. Proc.* 32:374, 1973.
- Kawai, N.; Mauro, A. and Grundfest, H.
Effect of black widow spider venom on the lobster neuromuscular junctions. *J. Gen. Physiol.* 60:659-664, 1972.
- Kelly, S.; Hart, E. J. and Desjardins, L.
A new H.G.P.R. T-deficient phenotype? *J. Med. Genetics* 9:482, 1972.
- Koenigsberger, M. R.; Patten, B. M. and Lovelace, R. E.
Studies of myoneural junction in normal full-term, premature and hypermagnesemic newborn infants. *Pediat. Res.* 7:193, 1973.
- Lovelace, R. E.; Schneider, S. and Nicholson, J. F.
Peripheral neuropathy and cerebral dysfunction in chronic liver disease. *EEG & Clin. Neurophysiol.* 34:814, 1973.

- Low, N. L.
Cerebral Palsy and Polyneuritis. In: *Pediatrics*, 15th ed. H. L. Barnett, ed. Appleton-Century-Croft, New York, 1972.
- Marco, L. A.; Copack, P.; Edelson, A. M. and Gilman, S.
Intrinsic connections of caudate neurons. I. Locally evoked field potentials and extracellular unitary activity. *Brain Res.* 53:291-305, 1973.
Intrinsic connections of caudate neurons. III. Locally evoked intracellular responses. *Exper. Neurol.* 40:683-698, 1973.
- Marco, L. A.; Ebel, H. C.; Sommers, D. and Gilman, S.
Abnormalities of muscle spindle afferent responses in congenital feline ataxia. *Exp. Brain Res.* 17:111-123, 1973.
- Marco, L. A.; Edelson, A. M. and Gilman, S.
Unit responses in anterolateral hypothalamus to local stimulation (Abstract). *Physiologist* 15:208, 1972.
- Mettler, F. A.
Neuropathological effects of sodium azide administration in primates. *Fed. Proc.* 31:1504, 1972.
Striatal induced obstinate progression in primates. *Fed. Proc.* 32:399, 1973.
Addendum to Aaron Smith's letter to the editor—Replies to two comments on "Objective indices of severity of chronic aphasia." *J. Speech & Hear. Disord.* 37:278-279, 1972.
- Miller, J. F. and Harter, D. H.
Acute viral encephalitis. *Med. Clin. North America* 56:1393-1404, 1972.
- Miyoshi, K.; Wolf, A.; Harter, D. H.; Duffy, P. E.; Gamboa, E. T. and Hsu, K. C.
Murine influenza virus encephalomyelitis. I. Neuropathological and immunofluorescence findings. *J. Neuropath. & Exper. Neurol.* 32:51-71, 1973.
- Nachmansohn, D.
The neuromuscular junction. The role of acetylcholine in excitable membranes. In: *The Structure and Function of Muscle*. G. H. Bourne, ed. Academic Press, New York, 1973.
Organophosphate insecticides. A challenging problem of environmental control. *Rehovot*, 7, no. 2, 1973.
Propriétés et fonction des protéines dans les membranes excitables; Un modèle intégrale de l'excitabilité nerveuse. *Biochimie* 55:365-376, 1973.
- Neumann, E.; Nachmansohn, D. and Katchalsky, A.
An attempt at an integral interpretation of nerve excitability. *Proc. Nat. Acad. Sci.* 70:727-731, 1973.
- Noback, C. R. and Mettler, F. A.
Centrifugal fibers in the retina of the Rhesus monkey. *Brain Behav. Evol.* 7:382-399, 1973.
- Penn, R.; Hilal, S.; Michelsen, W. J.; Goldensohn, E. S. and Driller, J.
Intravascular intracranial EEG recording technical note. *J. Neurosurg.* 38:239-243, 1973.
- Pippenger, C. E. and Kutt, H.
Common errors in the detection of anticonvulsant drugs (Abstract). *Clin. Chem.* 19:660, 1973.
- Pippenger, C. E. and Sichler, D. L.
A comparison of the detection of anticonvulsant drugs in whole blood, hemolyzed blood and plasma by gas liquid chromatography (Abstract). *Clin. Chem.* 19:666, 1973.
- Prasad, A. L. N. and Fahn, S.
A simplified method for the simultaneous determination of the biogenic monoamines, their precursors and metabolites (Abstract). *Trans. Am. Soc. Neurochem.* 4:105, 1973.
- Prives, J. M.; Reiter, M. J.; Cowburn, D. A. and Karlin, A.
Interactions of a cobra neurotoxin and affinity labels of the acetylcholine receptor in the electroplax. *Mol. Pharmacol.* 8:786-789, 1972.
- Reichman, L. B.; Shim, C. S.; Baden, M. M. and Richter, R. W.
Development of tolerance to street heroin in addicted and non-addicted primates. *Am. J. Pub. Health* 63:801-803, 1973.
- Richter, R. W.
Panel member, conference on heart disease in community medicine. A. Rosen, moderator. *Bull. New York Acad. Med.* 49:544-550, 1973.
- Richter, R. W.; Pearson, J.; Bruun, B.; Challenor, Y. B.; Brust, J. C. M. and Baden, M. M.
Complicaciones neurológicas en adictor a la heroína. *El Hospital* 29:12-18, 1973.
Neurological complications of addiction to heroin. *Bull. New York Acad. Med.* 49:3-21, 1973.
- Rivera-Dominguez, M.; Mettler, F. A. and Noback, C. R.
Origin of cerebellar climbing fibers in the Rhesus monkey. *Anat. Rec.* 175:425-426, 1973.
- Robinson, A. G. and Zimmerman, E. A.
Cerebrospinal fluid and ependymal neurophysin. *J. Clin. Invest.* 52:1260-1267, 1973.
- Rose, A. L.; Norton, W.; Duffy, P. E. and Chutorian, A. M.
Alexander's disease: Morphological and chemical studies of a case. *Pediat. Res.* 7:429, 1973.
- Rothner, A. D. and Chutorian, A. M.
Occult neuromuscular disease in 100 consecutive patients with scoliosis. *Neurology* 23:420, 1973.
- Rothner, A. D.; Chutorian, A. M. and Keim, H.
Associated disorders in 100 consecutively studied children with scoliosis. *Pediat. Res.* 7:422, 1973.
- Rowan, A. J.; Pippenger, C. E.; McGregor, P. A. and French, J. H.
The relationship of seizure activity to anticonvulsant blood concentrations (Abstract). *EEG & Clin. Neurophysiol.* 34:745, 1973.
- Rowland, L. P.; Lisak, R. P.; Schotland, D. L.; DeJesus, P. V. and Berg, P.
Myasthenic myopathy and thymoma. *Neurology* 23:282-288, 1973.
- Ruiz-Manresa, F. and Grundfest, H.
Ionic pharmacology of the electrically excitable potassium conductance system (g_K) of ccl electroplaques. *J. Gen. Physiol.* 61:268, 1973.

- Schwartz, T. L. and Katz, G. M.
Temporal control of voltage clamped membranes; theoretical principles. *17th Ann. Meeting, Biophys. Soc.* 1973, p. 164a.
- Shafer, S. Q.; Bruun, B. and Richter, R. W.
Hypertension and intracranial hemorrhage in stroke mortality of blacks under age 65 (Abstract). *Clin. Res.* **21**:450, 1973.
- The influence of associated diseases on mortality of acute stroke (Abstract). *Neurology* **23**:443, 1973.
- Shafer, S. Q.; Bruun, B. and Richter, R. W.
The outcome of stroke at hospital discharge. *Stroke* **4**:782-786, 1973.
- Sorenson, A. L.
Changes in transparency and volume associated with the nonsolvent space of isolated muscle fibers. *J. Gen. Physiol.* **61**:256, 1973.
- Sorenson, M. M.
The free amino acids in peripheral nerves and in isolated inhibitory and excitatory nerve fibres of *Cancer Magister*. *J. Neurochem.* **20**:1231-1245, 1973.
- Sorenson, M. M.; Dawson, M. J.; Reuben, J. P. and Brandt, P. W.
Modes of action of anions which attenuate tensions in skinned muscle fibers of the crayfish. *17th Ann. Meeting, Biophys. Soc.* 1973, p. 182a.
- Su, P. C. and Goldensohn, E. S.
Progressive supranuclear palsy — Electroencephalographic studies. *Arch. Neurol.* **29**:183-186, 1973.
- Takagi, A.; Schotland, D. L. and Rowland, L. P.
Sarcoplasmic reticulum in Duchenne muscular dystrophy. *Arch. Neurol.* **28**:380-384, 1973.
- Takagi, A.; Schotland, D. L.; DiMauro, S. and Rowland, L. P.
Thyrotoxic periodic paralysis: Function of sarcoplasmic reticulum and muscle glycogen. *Neurology* **23**:1008-1016, 1973.
- Tennyson, V. M.
Fluorescence and electron microscopic studies of developing sympathetic neuroblasts in the fetal rabbit. *Proc. 3rd Ann. Meeting, Soc. Neurosci.* 1973, p. 310.
- Ultrastructural studies of sympathetic ganglia of the fetal, postnatal, and adult rabbit. *Anat. Rec.* **175**:456, 1973a.
- Tennyson, V. M.; Barrett, R. E.; Cohen, G.; Cote, L. J.; Heikkila, R. and Mytilineou, C.
Correlation of anatomical and biochemical development of the rabbit neostriatum. *Prog. Brain Res.* **40**:203-217, 1973a.
- Tennyson, V. M.; Brzin, M. and Kremzner, L. T.
Acetylcholinesterase activity in the myotube and muscle satellite cell of the fetal rabbit; an electron microscopic-cytochemical and biochemical study. *J. Histochem. & Cytochem.* **21**:634-652, 1973b.
- Tennyson, V. M.; Cohen, G.; Mytilineou, C. and Heikkila, R.
6, 7-Dihydroxytetrahydroisoquinoline: Electron microscopic evidence for uptake into the amine-binding vesicles in sympathetic nerves of rat iris and pineal gland. *Brain Res.* **51**:161, 1973c.
- Tennyson, V. M. and Marco, L.
Intrinsic connections of caudate neurons. II. Fluorescence and electron microscopy following chronic isolation. *Brain Res.* **53**:307-317, 1973.
- Tennyson, V. M.; Mytilineou, C. and Barrett, R. E.
Fluorescence and electron microscopic studies of the early development of the substantia nigra and area ventralis tegmenti in the fetal rabbit. *J. Comp. Neurol.* **149**:233-257, 1973d.
- Thornhill, H. I.; Richter, R. W.; Shelton, M. and Johnson, C.
Neuropathic arthropathy (Charcot forefeet) in alcoholics. *Orthoped. Clin. North America* **4**:7-20, 1973.
- Walker, A. E.; Allen, N.; Bennett, D.; Boshes, B.; Goldensohn, E. S.; Korein, J.; McGee, F.; Poskanzer, D.; Runk, L.; Suter, C. and Wiederholt, W.
Results of a prospective study on 500 patients to determine the diagnosis of cerebral death. *EEG & Clin. Neurophysiol.* **34**:719, 1973.
- Zimmerman, E. A.; Hsu, K. C.; Robinson, A. G.; Carmel, P. W.; Frantz, A. G. and Tannenbaum, M.
Studies of neurophysin secreting neurons with immunoperoxidase techniques employing antibody to bovine neurophysin. I. Light microscopic findings in monkey and bovine tissues. *Endocrinology* **92**:931-940, 1973.

Nursing

Professor and Chairman of the Department • Director of Service

MARY C. CRAWFORD

The admission of 34 freshman students in September marked the beginning of the School of Nursing's new four-year integrated program. Since grant support to develop this program has as yet not been obtained, progress has been possible only because of generous support from the Board of Trustees of the St. Luke's Hospital Center and effort on the part of the faculty of the School of Nursing. After participating in the orientation program developed by the students of Barnard and Columbia College, the new students moved into the Eli White Residence Hall at St. Luke's Hospital Center. They are enrolled in liberal arts courses at Barnard and at the School of General Studies.

Miss Jeanne Murray was appointed as Course Coordinator for Community Health I and II, offered in the Freshman year of the New Program. Miss Constance Cleary was appointed as Project Director for the New Program. In the program admitting Junior Transfers and College graduates, several new elective courses were offered: Nursing 89: Psychosocial Aspects of Nursing; Nursing 92: Health History: Data Collection for Health Care, and Nursing 91: Clinical Independent Study. The pass/fail system is being evaluated in the Behavioral Science courses as well as in the clinical components of several other courses.

During a summer faculty workshop, course objectives for Nursing 79 Medical/Surgical Nursing II were developed in both the cognitive and affective taxonomy. Students taking this course in the Fall semester are responsible for communicating to the

instructors by means of logs the manner in which course objectives are being met. The major changes in Nursing 68: Maternity Nursing involve refocusing of the classes on the nursing process and introduction of a clinical follow-through for each student with one mother from the time she registers in the antepartum clinic through delivery, the postpartum period, and home follow-up. To provide opportunities for students to recognize the importance of health assessment and supervision of children, Nursing 62: Pediatric Nursing places increased emphasis on preventive pediatrics including greater use of ambulatory pediatric services for clinical experience. A major part of the clinical experience in Nursing 72: Psychiatric Nursing is now being offered in the community, and collaborative psychiatric-community health projects for students in Nursing 72 and Nursing 88: Community Health Nursing have been developed. This involvement provides students with the skills to assess health as well as illness and to perceive clients' individual needs within home environments, clinic settings, and day-care centers, as well as within the hospital setting.

Baccalaureate degrees were awarded to 134 students including 13 registered nurses. Six graduates received Masters degrees in Psychiatric-Community Mental Health Nursing and 16, degrees in Maternity Nursing and Nurse-Midwifery. One hundred and thirty-four students from six affiliating diploma schools of nursing completed a 10-week course in nursing of children at Babies Hospital. The following students in the Columbia nursing programs were

selected for graduation awards: Margaret Elliott Prize: Ellen Wojtow and Sr. Margaret Healy; Sigma Theta Tau Award: Irving Ross and Alexandra O'Shea; and the Arlene Myers Award: Veronica Arikian.

The retrenchment necessitated by changes in federal funding had a profound impact on the direction of the Masters program in Psychiatric-Community Mental Health Nursing. After deliberation, the decision was made to shorten the program from two academic years to a 10-month program. This revision involves curtailing the teaching of group dynamics and field placement, and discontinuation of the research thesis requirement.

A grant from the D.H.E.W. Maternal and Child Health Services allowed expansion of the graduate program in Maternity Nursing and Nurse-Midwifery. Instead of the usual 12 students, 17 were admitted for the academic year 1972-73. The faculty concentrated efforts on development of additional clinical facilities for student experience.

The Columbia-Presbyterian School of Practical Nursing graduated 18 students in the Spring class and 27 in the Fall class. Eight students graduated from the Presbyterian Hospital School of Operating Room Technology. This program's curriculum was increased from eight to nine months to make the school eligible for accreditation by the American Medical Association.

The Nursing Department is particularly pleased with progress made this year toward increased quality of patient care through patient and staff educational programs. Weekly parent meetings were inaugurated on Babies Hospital 10 with the nursing staff, social workers, and psychiatrists participating. Group meetings with the children were also started. The parents of children with leukemia continue to meet monthly with Miss Penny Bushman and Drs. Wolfe and Gilder.

In Orthopedics, general instructions for patients receiving total hip replacement were prepared by Catherine Hogan, Nursing Leadership Student, with the assistance of the Nursing Service Education and Physical Therapy staffs. This information was received favorably by parents and is being prepared for formal publication and distribution.

With Social Service personnel, Nurse-Midwives in Sloane are holding weekly classes for all teenagers attending the antepartal clinic. The response to these classes has been so good that many times there is standing room only. Many women continue to attend even after delivery.

In the Neurological Institute, the Clinical Specialist participates with other members of the nursing

staff to prepare patients and family for return home or transfer to a long-term-care facility. A multidisciplinary approach to planning for patient care post hospital is developing. The Neurological Clinic Nurse Specialist has had an active case load of 320 patients. Mrs. Marjorie Fleming continues to provide the necessary liaison with the Visiting Nurse Service and coordinates services for these patients from other departments within the Medical Center. In keeping with the growth in clinical facilities and improvements in Vanderbilt Clinic, the nursing staff provided an expanded health teaching program, pioneered successful primary care by Nurse Practitioners, and developed greater interaction with other health disciplines.

Neurological Institute supervisors participated in nursing and health care displays at the Washington Heights Health Fair and provided volunteer experience for 15 students and their teacher from the George Washington High School work-study program. Workshops on Neurological Nursing were offered to private duty nurses, operating room nurses, and night nurses at the Neurological Institute.

Audiovisual media were developed by the Staff Development Department for self learning. A "night cart" is well utilized by nursing staff in Surgery and the Neurological Institute. A record-keeping system was also initiated to assure Continuing Education units credit for attendance at Continuing Education Programs co-sponsored by the School of Nursing and the Presbyterian Hospital Nursing Service, and for some in-service programs sponsored by the Hospital.

A new division, Indirect Patient Care Services, was developed this year. Comprised of ward managers, ward clerks, and the transportation service, it is administered by a new Assistant Director of Nursing. Compartmentalization of these functions is intended to improve services to staff and to help the nursing staff focus on patient care.

To conserve funds, the Exchange Visitor Program was terminated. Since its inception in the Fall of 1966, 196 visitors from 31 foreign countries participated. Both the exchange nurses and the Medical Center staff were overwhelmingly positive in their responses to this program. The loss of this means of crosscultural enrichment is sadly missed.

Staff Development programs were completed by the following members of the Nursing staff:

	No. of participants
Nurses Aides Orientation (6 courses, 1 week each)	36
Ward Clerks (4-week course)	16

	<i>No. of participants</i>
Nurses and Licensed Practical Nurses	
Pharmacology Review (8 courses, 40 hours each)	119
Orientation (20 hours) R.N.	318
LPN & ICT ...	73
Leadership Development (20 hours)	
R.N. (2 courses)	44
LPN (3 courses)	17
Open Heart Recovery Room (35 hours)	20
Head Nurse Workshops (4 hours monthly)	436

Employment of registered nurses with all three types of educational preparation at the Presbyterian Hospital increased. Registered nurse positions grew by 25, and practical nurse positions, by 16. The numbers of registered and practical nurses employed increased, respectively, by 52 and 25. For the first time in several years all nursing positions were filled in the Operating Room. Because of the full staff complement, Room N was opened five instead of two days a week. The School of Nursing Office moved to Maxwell Hall and the Nursing Service Office is consolidated in the Harkness Pavilion Main Floor wing.

Newly appointed to the Faculty are: Ellen Batt, Assistant Professor; Beverly Capaccio, Associate in Clinical Nursing; Ann Kellett, Associate in Clinical Nursing; Grace Nespoli, Associate in Clinical Nursing; Margarete Sandelowski, Associate in Clinical Nursing; Lillie Shortridge, Associate in Clinical Nursing; Elizabeth B. Zdibak, Associate in Clinical Nursing; Elinor Buchbinder, Instructor in Clinical Nursing; Beth Shapiro, Instructor in Clinical Nursing; Mary M. Ho, Instructor in Clinical Nursing; and Jean Kobritz, Instructor in Clinical Nursing at Roosevelt. Miss Jeanne Calle was appointed Media Coordinator assigned to Nursing. Promotions include: Anna Earle to Associate Professor with tenure; Marjorie A. Bredice to Assistant Professor; Keville Frederickson to Assistant Professor; Eura M. Lennon to Assistant Professor; Elizabeth A. Mahoney to Assistant Professor; Margaret Kelley to Associate in Clinical Nursing; Irene McEachen to Associate in Clinical Nursing; Bonita Schultze to Associate in

Clinical Nursing; and Carolyn Wrubel to Associate in Clinical Nursing.

The following Instructors were appointed to the faculty of the School of Practical Nursing: Linda Werner, Karen Hildebrandt, Mary Byrne, Josephine Aparri, and Marilyn Coker. Miss Carolyn Stewart was promoted to Assistant to the Director.

New appointments in the Nursing Service include: Madeline DeTalvo, Assistant Director of Nursing, Neurological Institute; Marjorie Flaherty, Supervisor, Vanderbilt Clinic; Sharon Sawitzke, Nurse Specialist, Surgery; Nancy Boccuzzi, Supervisor, Pediatrics; Carolyn Keizer, Supervisor, Pediatrics; Mary Ellen Wyllie, Supervisor, Vanderbilt Clinic; and Mary Baxter, Mary Moran, and Jacqueline Webb, Screening Practitioner. Alberta Rayner transferred from the position of Director of Exchange Visitor Program to that of Patient Care Coordinator, Surgical Nursing Service. Mr. David Markant was promoted from Ward Manager to Assistant Director in charge of Indirect Patient Care Services. Miss Priscilla Parke, Supervisor, Neonatal Special Care Unit, retired after 25 years in the Nursing Service and the School.

Professional activities and papers presented by faculty of the School of Nursing and Hospital Nursing Staff this year are too numerous to itemize. Mrs. Charmaine Fitzig continued on the Executive Board of the Health Manpower Development Corporation and is active in the Comprehensive Health Planning Organization Committee for Comprehensive Health Planning, Manhattan North. Dr. Anna Earle was invited to participate in the Medical Sociology Conference in Elsinore, Denmark.

The student Scholarship Fund Benefit Bridge Committee, whose members include mothers of students, alumnae of the school, and Medical Center wives, contributed approximately \$19,400 in scholarship funds this year. Other scholarship funds for Nursing students were donated by the Quaker Hill Foundation, the National Foundation for Graduate Nurse Education, the Columbia University Presbyterian Hospital School of Nursing Alumnae Association, the Presbyterian Hospital Women's Auxiliary, and the Exxon Corporation. Scholarship awards were received for graduate and undergraduate students from the Department of Health, Education and Welfare.

1973 Publications

Nursing

Beshore, Julie, R. N.

Are you ready for cardiac arrest? *In-Service Train. & Education* 2:26-31, 1973.

Crawford, Mary

The use of the clinical specialist. In *The Clinical Nurse Specialist: Interpretations*. Appleton Century Crofts, New York, 1973.

del Bueno, Dorothy

A C.E. unit course. *Nursing Outlook* 21:504-505, 1973.

Recognizing fat embolism in patients. *RN Magazine* 36:48-55, 1973.

Set goals, Then ask: Did I get there? *In-Service Train. & Education* 1:60-70, 1973.

What about the preparation for the in-service educators? *J. Cont. Ed. Nursing* 30:11-13, 1972.

del Bueno, Dorothy; McLukey, Patricia and Altano, Rosemary

Staffing and patient care. *Supervisor-Nurse* 4:23-28, 1973.

Jackson, Bettie

Participant observation and nursing research. *Supervisor-Nurse* 4:32-40, 1973.

Rayner, Ruth and Jones, Bonnie

Foreign nurses: Dedicated exchange-visitors. *Exchange* (U.S. Advisory Commission on International, Educational and Cultural Affairs, Department of State) 9:36-44, 1973.

Obstetrics and Gynecology

RAYMOND L. VANDE WIELE

Rappleye Professor and Chairman of the Department • Director of Service

Teaching

Changes in Staff

Dr. Elizabeth Connell, Associate Professor of Obstetrics and Gynecology, resigned to join the Rockefeller Foundation. Dr. Michelle Warren, who had been an assistant professor, joined the faculty of the George Washington University Medical Center. Dr. Roy Petrie returned to the Department as an Assistant Professor to work in the Perinatal Division. Dr. Robert Patchell resigned as Acting Director of the Service at the Harlem Hospital and Dr. Stephen Matseoane succeeded him.

Changes in Curriculum

As in previous years, the Department held a very successful postgraduate course. The regular five-day course was followed by a series of advanced workshops in Perinatology, Oncology, Endocrinology, and Endoscopy.

Research

Genetics

Dr. O. J. Miller and his associates are continuing their studies involving chromosome banding techniques. He and Rhona Schreck, graduate student in the Department of Human Genetics and Development, working with Dr. Sam Beiser (deceased) and Dr. Bernard Erlanger (Microbiology), have used antibodies to specific nucleoside bases of DNA to show that chromosome banding patterns are due to the presence of differences in the average base com-

position of adjacent segments of metaphase chromosomes.

The specificity of chromosome banding patterns, whether produced chemically or by the use of fluorescent tags, has made it possible to identify every chromosome and to recognize heretofore undetectable abnormalities. With Drs. Dorothy Warburton, Director of the Clinical Genetics Laboratory, and Dorothy A. Miller (Human Genetics), Dr. O. J. Miller has concluded the application of new staining techniques to clinical problems.

Drs. D. A. Miller and O. J. Miller have reviewed the progress made by this group in working out the karyotype and chromosome maps of the mouse. Banding techniques also permit identification of virtually all chromosomes in long-term cultured cell lines and even in somatic hybrid cells produced by fusing human and mouse cells. Drs. Penelope W. Allderdice, now in the Department of Genetics at Memorial University, St. John's, Newfoundland, O. J. Miller, Peter L. Pearson of the Department of Genetics, University of Leiden, George Klein, Institute of Tumor Biology, Karolinska Institute, Stockholm, and Henry Harris, Dunn School of Pathology, University of Oxford, have developed methods for characterizing the human chromosome complement in man-mouse somatic hybrid cell lines produced by fusing mouse cells with human cells. Rapid progress can be made in somatic cell genetics, and especially in assigning genes to specific human chromosomes, with the aid of these techniques.

The laboratory of Dr. Georgiana Jagiello has con-

tinued to study mammalian meiosis with emphasis on development of an evolutionary scheme of meiotic characteristics. Cytogenetic investigation of 500 human oöcytes has revealed a chiasmata frequency higher than those in all other female mammals studied thus far. The parallel study with Dr. J. S. Fang of mitotic complements of ovarian material has demonstrated a statistically significant increase in loss of the X chromosome beginning at 30 years of age, as compared with somatic tissue, in which increase in X chromosome loss is reported to occur at ages 55-64 years. Correlation of this X chromosome loss with clinical menopause is in progress.

Meiotic analyses of oöcytes from many infra-human female species have been completed and published. Base line data on meiotic behavior previously unavailable for female mammals were obtained, and correlation of the endocrine environment and morphology of each complement with the number and position of chiasmata has been studied in connection with design of a valid infrahuman model for detecting mutagenesis. Evaluation of the effect of many potential environmental mutagens on mammalian eggs has continued and reports of effects of mercury, caffeine, and tranquilizers published. Data on the question of the reported mutagenicity of the most commonly used oral contraceptives have been accumulated in monkey, sheep, cow, and mouse oöcytes and a retrospective analysis of human material is in progress.

Correlates of the meiotic process in female mammals have been studied. Data on the specific physiologic requirements for the resumption of meiosis in female mammals for luteinizing hormone and other ovarian hormones, as well as intermediates reported to be substitutes for LH action in other systems (prostaglandins, cAMP), have been accumulated in human, monkey, and sheep. Development of the midbody I and first polar body has been studied in detail with light microscopy in mouse and is being extended to other species with transmission electron microscopy. *In vitro* and *in vivo* chemical dissection of the oöcyte meiotic process with inhibitors of nucleic acid synthesis has continued and the separation into several biochemical compartments demonstrated. A technique for specifically staining the centromeres of female meiotic material has been developed in collaboration with Dr. V. G. Dev.

At the Roosevelt Hospital the effect of heroin and methadone on the chromosomes of addicted mothers and their offspring is being studied in collaboration with Dr. Cyril Abrams (Pediatrics).

Reproductive Biochemistry

The laboratory under the direction of Dr. Seymour Lieberman continues its studies of the biochemistry and metabolism of the steroid hormones. Dr. Richard Hochberg is pursuing his studies of the biosynthetic conversion of cholesterol into pregnenolone. With Dr. Patrick MacDonald, he has shown that oxidation at C-20 and side-chain cleavage can proceed even when C-22 is fully substituted. The cleavage reaction is now viewed as involving a steroid-oxygen-cytochrome P-450 enzyme complex which yields pregnenolone directly without the intermediary of cholesterol derivatives hydroxylated in the side chain. Dr. Paula Zimmering completed a study of the minor nucleosides of uterine tissue and is currently working on a project designed to elucidate the factors involved in the regulation of the secretion of dehydroisoandrosterone sulfate by adrenal glands. Dr. Laura Ponticorvo has investigated the *in vitro* conversion of cholesterol sulfate to C₂₁ and C₁₉ steroid sulfates by testes. Dr. Fred Chasalow is studying the bovine adrenal enzyme complexes that catalyze 17- α and 21-hydroxylation of steroids. Dr. Violet Lippman is investigating the nature of the intermediates involved in formation of C₁₉- Δ^{16} -steroids from their 21-carbon precursors. Two graduate students in biochemistry are working in this laboratory. Mr. Frank Gasparini has shown that boar testes microsomes, a known source of Δ^{16} -androgens, can convert pregnenolone sulfate to the C₁₉- Δ^{16} -steroid sulfate without removal and reconjugation with sulfate. Ms. Marie Monaco is studying the transformation of steroid sulfates in ovarian tissue. Dr. Wylie Hembree has continued to study the tritium labeling of polypeptide and protein hormones. High-specific-activity ³H-GnRH (gonadotropin releasing hormone) has been prepared, as has ³H-oLH. Both labeled hormones have been purified and shown to be biologically active by an *in vitro* assay. Drs. Hembree and Richard Ehrenkauffer have investigated the extent of aliphatic and aromatic reduction by the tritium atom labeling reaction and have shown that amino acid derivatization in the form of peptides is associated with a 10- to 1000-fold increase in tritium hydrogen exchange in the molecule at sites other than the alpha carbon.

Reproductive Endocrinology

Members of the neuroendocrine group have considerably expanded their work dealing with central nervous system (CNS) control of reproductive function. Drs. Dominique Toran-Allerand (Neurology), Michael Salcman, a resident in Neurosurgery, Shigeo Araki from Japan, and Ulf Schwartz, a WHO trainee

from Germany, have joined the group. Drs. Peter Carmel (Neurosurgery), Michel Ferin and Earl Zimmerman (Neurology) have completed their study on the CNS localization of the estrogen inhibitory feedback centers that control LH secretion in primates. These results are being correlated with a radioautographic study of estradiol uptake in monkeys in a collaboration with Dr. Donald Pfaff of the Rockefeller University. Techniques for hypothalamic deafferentation of the hypothalamus as well as for collection of hypophyseal portal blood in monkeys have been developed. By means of radioimmunoassay and immunoperoxidase techniques, evidence for the secretion of vasopressin and neurophysin into the hypophyseal portal vessels was found and a role for these neurohormones in anterior pituitary function has been suggested. With Dr. Araki, secretory pathways for GnRH were also investigated. Studies of control of pituitary gonadotropin secretion by GnRH in the rhesus monkey have revealed a greater role for the pituitary in determining the response to the releasing hormones than was previously thought. The control of neurophysin secretion by estrogens and nicotine is being studied in collaboration with Dr. Robinson of the University of Pittsburgh. The causative role of ovarian steroids in midcycle LH release has been assessed in monkeys actively immunized to these steroids by Drs. Schwartz and Inge Dyrenfurth.

Drs. Raphael Jewelewicz, Suhail Khalaf, and Roy Ans completed a study of the effect of single I.V. injections and continuous infusions of GnRH in normal subjects and patients with various endocrinopathies. The luteolytic activity of TRH was investigated in six normal women; a decline in plasma progesterone was noted in half of them. Dr. Michelle Warren completed an investigation of the clinical and metabolic features of patients with anorexia nervosa.

Patients with male infertility are being studied by Dr. Hembree. His studies include dynamic testing of testicular function and determination of the incidence of testicular mitotic and meiotic chromosomes and abnormalities (in collaboration with Dr. Jagiello). Mr. James Overstreet, a fourth-year medical student, is evaluating human gamete interaction as an index of fertility.

At the Roosevelt Hospital, Dr. Muriel Feigelson is studying the elaboration of steroid-sensitive proteins in the female genital tract.

Maternal and Child Health

The Division of Perinatology, under the direction of Dr. L. Stanley James (Pediatrics and Anesthesi-

ology), has had as its main clinical research objective the development of a complete monitoring system for the perinatal patient, i.e., mother and fetus-newborn infant. This program has been designed with the assistance of Mr. Henry Rey, M.S., and will allow for continuous on-line analysis by computer of the vital parameters of fetus and mother.

Dr. Edward T. Bowe, with Drs. Salha Daniel and Ming-Neng Yeh, using a sheep preparation with chronically implanted catheters, has completed a study of the renal response of the fetal lamb to partial occlusion of the umbilical circulation. They are also studying the maturation of the fetal kidney in sheep and have continued their investigations of the origin of bilirubin in amniotic fluid. Dr. Yeh, with Drs. Akira Morishima and Wendell Niemann, have completed studies on the cardiovascular response of fetal baboons to complete occlusion of the umbilical vessels. Other objectives of this group of investigators include studies of the effect of spinal anesthesia on the maternal and fetal cardiovascular system, of the cardiovascular response of fetuses to I.V. acetylcholine, and of the effects of alpha and beta sympathetic blockades on fetal responses to stress.

Clinical trial of RhoGAM has been continued by Drs. Vincent J. Freda and John G. Gorman (Pathology). Of the 497 mothers originally included in this study, 182 subsequently delivered Rh positive babies. None of the 149 RhoGAM-protected mothers was sensitized at the time of this subsequent Rh positive delivery, whereas 4 of 33 control mothers were immunized and their babies affected. Twenty-two of the treated mothers delivered a third unaffected Rh positive baby and four, a fourth unaffected Rh positive baby. Drs. Freda and Bowe are continuing their Intrauterine Transfusion Program using the Liley Closed Transabdominal Method. Two hundred and eighty-two transfusions have been carried out on 166 babies with a total survival rate of 25 per cent.

Dr. Ines Mandl and her associates have continued to investigate several aspects of the underlying cause of the respiratory distress syndrome in the newborn. The previously reported deficiency in the serum alpha₁-antitrypsin appears to be transient, since it reverts to normal levels in patients who survive. The mechanism differs from that proposed for pulmonary emphysema and infantile cirrhosis of the liver, in that in the latter condition the alpha₁-antitrypsin accumulates in the liver rather than in the hyaline membrane. Significant differences in the composition of lung elastin from normal babies and from those with the respiratory distress syndrome were found to correlate with maturity as well as severity of the disease. Dr. Stephen Keller, with Drs. Mandl and

Evans (Pediatrics), has studied developmental changes in lung elastin.

At the Roosevelt Hospital, Drs. Terusada Horiguchi and Walter Wick have studied the influence of continuous fetal monitoring upon fetal morbidity.

At the Woman's Hospital, St. Luke's Hospital Center, Drs. Tawfik Rizhallah and William Kelly have completed a study of the levels of immunoreactive estriol (mainly free estriol and estriol-16-glucuronide) during pregnancy.

Neoplastic Disease

Dr. Henry Clay Frick, II, in collaboration with Dr. George Hyman (Medicine), continues to evaluate various chemotherapeutic agents in the treatment of advanced ovarian cancer. With Drs. Thomas F. Halpin and Equinn Munnell, Dr. Frick has completed a study of persistent and recurrent cases of carcinoma of the cervix at the Presbyterian and Delafield Hospitals during the years 1955 through 1964. Drs. Frick, Munnell, and Ralph M. Richart reviewed cases of carcinoma of the endometrium treated at the Presbyterian and Delafield Hospitals during the ten-year period 1956-1965. Dr. Frick is preparing tables showing results of therapy for cancer of the cervix and vagina for inclusion in Volume 16 of the *Annual Report on the Results of the Treatment of Carcinoma of the Uterus and Vagina* (Stockholm), which is published under the patronage of the International Federation of Gynecology and Obstetrics.

Dr. Mary Parshley has maintained lines of human cervical, ovarian, and breast carcinoma cells in tissue culture for assay of the carcinocidal effect of a number of biologically active agents. Breast carcinoma cells have been supplied to the laboratory of Dr. Sol Spiegelman of the Institute of Cancer Research for analysis of enzyme activity associated with the presence of virus in these cells.

Dr. Vande Wiele has been appointed Director of the Division of Hormones and Neoplastic Diseases of the Cancer Research Center recently established at the Columbia-Presbyterian Medical Center with N.I.H. funding. Dr. Vande Wiele and associates have started a study of gonadal function in patients with endocrine-dependent tumors such as breast cancer and adenocarcinoma of the uterus.

At Woman's Hospital, St. Luke's Hospital Center, Dr. Rizkallah, with Dr. William Kelly, has studied the rate of production of estrogens and the rate of conversion of androstenedione to estrone in a group of women with endometrial carcinoma.

Obstetrical and Gynecological Pathology

Drs. Richart and Alex Ferenczy (Pathology) have continued their studies of the female genital tract using both transmission and scanning electron microscopy. They have been particularly interested in ovarian neoplasms and have contributed to the elucidation of the histogenesis of several tumor types. In addition, they have studied the fine structural aspects of many other female genital tract tissues and have prepared an atlas of the electron microscopy of the human female genital tract which is in press.

Family Life Services

Several clinical and animal studies were carried out during 1973 in an effort to develop ambulatory methods of female sterilization. These studies were performed by Drs. Robert S. Neuwirth and Richart. A total of 175 women has undergone sterilization by tubal cautery through the hysteroscope; bilateral closure rates, as determined by subsequent hysterosalpingography, were 90 per cent.

In current studies in rabbits, the effect of concentrated dextran solutions on the development of inflammatory responses in genital tract tissue is being evaluated. Under World Health Organization contracts, studies of the effect of tubal plugs, fabricated of various metals, plastics and drugs, are being evaluated in monkeys. Quinacrine suspensions to produce closure of the human fallopian tube are being tested in women under a Population Council grant. Side effects have been unremarkable and studies of effectiveness are pending.

At the Roosevelt Hospital, Dr. Thomas Dillon and associates have completed a study of the use of prostaglandins in second-trimester abortion.

Clinical studies to evaluate Copper-T intrauterine devices were carried out at the Presbyterian Hospital, Womens' Hospital, and the Roosevelt Hospital.

The effect of quingestanol acetate, a progestational oral contraceptive compound, on plasma gonadotropins and ovarian function is under study at Woman's Hospital. Preliminary results indicate that ovulation is not suppressed and that such a drug exerts its contraceptive effect by altering the cervical mucus, rendering it unfit for penetration by sperm.

Acknowledgment

The great assistance given to the Department by a number of outside sources is recognized with appreciation. The Health Research Council of the City of New York again provided support for faculty.

A major part of the research work of the department has been made possible by grants from the United States Public Health Service, the United

States Atomic Energy Commission, the Office for Economic Opportunity, and the City of New York Department of Health. Additional research support was provided by many private foundations including the following: The Population Council, Damon Runyon Memorial Fund for Cancer Research, the National Foundation, the Arthritis Foundation, Inc., New York Chapter, the Ford Foundation, and the Rockefeller Foundation. Several industrial organizations have also supported the research programs of the department including: The Council for Tobacco Research, U.S.A., Chemical Research and Manufacturers, Inc., and the Ortho Research Foundation. The department gratefully acknowledges generous gifts from Dr. Henry Clay Frick, Mr. R. Grossman, the William P. Goldman & Bros. Foundation, and Mr. and Mrs. Rudolf Smutney, as well as several gifts in memory of Judith Fernandez. Finally, contributions too numerous to acknowledge individually were received by the department in memory of Dr. Virgil Damon.

Patient Care

The development of an intensive care unit on the delivery floor has already been mentioned. The ultimate goal is to monitor the majority of women during labor in order to have a precise evaluation of the condition of the fetus as labor progresses. The percentage of patients monitored has increased over the last year from approximately 10 per cent to between 50 and 70 per cent. The initial impact of this change in practice has been a significant reduction in the number of babies that are depressed at birth.

The new Ambulatory Endoscopic Unit has served 192 patients (243 procedures) during the year. Virtually all patients were admitted for less than eight hours. Most patients underwent a sterilization procedure at minimal cost and great convenience. These procedures have been remarkably safe, as only two complications of any consequence occurred, both of which required several days of additional hospitalization but led to no serious long-term effects. Consequently, the utilization of this program has risen to full capacity.

At the Roosevelt Hospital a fully functioning Diagnostic Ultrasound Unit has been established under the aegis of Obstetrics and Gynecology and the Department of Radiology.

Clinical Report

Reflecting the nation-wide trend, there has been a moderate decline in our delivery rate, most pronounced in the number of private deliveries. Unfortunately, this appears to be mainly due to the alarming increases in the cost of private rooms, a most disturbing trend for which there appears to be no remedy on the horizon. Although there was an increase in the total number of gynecologic operations, there has been a significant drop in the ward gynecologic operations, a most serious development for our residency program. This drop is to be expected and has been observed in all ward services throughout the country, clearly as a result of the increasing number of patients with medical insurance coverage which assists them in obtaining private or semiprivate care. The number of cancer patients at the Columbia-Presbyterian Medical Center has been stable but there has been a further decline in admissions to the Francis Delafield Hospital.

There were three maternal deaths in 1973, each "technical." One patient with a history of depression and suicidal gestures who was receiving methadone maintenance therapy committed suicide one month after undergoing an elective abortion with tubal ligation. One patient who had been seen once in our antepartum clinic was admitted to the Sydenham Hospital and died of a ruptured brain aneurysm. The third patient died in the 24th week of gestation from fulminating carcinoma of the breast with metastases.

There has been a rapid expansion of the utilization of the monitoring unit in the Labor Room, and now over 60 per cent of our patients admitted in labor are being monitored. The development of a high-risk unit has now been completed, and the unit is operational. Similarly, the Transitional Care Nursery has been operational for the last four months and has proved itself to be the most important intermediate between our regular nursery and the Intensive Care Nursery in Pediatrics.

The Ambulatory Surgery Unit on the 16th floor has undergone considerable expansion. Most of our tubal sterilizations are now done by laparoscopy and a significant number of patients undergo sterilization by cauterization of the tubal ostia through the hysteroscope.

TABLE 1
CLINIC VISITS

	1969	1970	1971	1972	1973
Obstetrical	29,333	35,125	33,185	33,504	30,190
Gynecological	18,178	15,894	14,915	15,380	12,271
Total	47,511	51,019	48,100	48,884	42,461

TABLE 2
VIABLE DELIVERIES

	<u>1960-1969 Average</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Ward	3,048	2,584	2,147	2,222	2,000
Semi-Private	700	756	739	705	714
Private	644	604	508	426	375
Total	4,392	3,944	3,394	3,353	3,089

TABLE 3
PERINATAL MORTALITY

	<u>1969-1970 Average</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Ward	22.2/M*	25.7/M	21.6/M	19.8/M	22.0/M
Private and Semi-Private	20.4/M	19.7/M	24.0/M	18.1/M	15.6/M

*M — per thousand viable births (more than 1000 grams).

TABLE 4
RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

<u>Weight in Grams</u>	<u>Total Births</u>	<u>Total Perinatal Deaths</u>	<u>1973 Per Cent Perinatal Mortality</u>
500 - 1,000	36	33	91.8
1,000 - 1,500	30	20	66.7
1,500 - 2,000	71	14	19.7
2,000 - 2,500	166	16	10.4
Over - 2,500	2,818	11	0.4
Total	3,121	94	3.0

TABLE 5
OPERATIVE DELIVERIES

	<u>Ward</u>	<u>Private & Semi-Private</u>	<u>Total</u>
Cesarean Sections	330 (16.5%)	187 (17.2%)	517 (16.7%)
Primary	248	115	363
Repeat	82	72	154
Mid Forceps	76	65	141 (4.5%)
Low Forceps	311	247	558 (17.9%)
Breech Deliveries	47	28	75

TABLE 6
GYNECOLOGIC OPERATIONS

	<u>1960-1969 Average</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Ward	882	630	603	655	597
Semi-Private	578	569	553	553	525
Private	457	507	496	485	657
Total	1,917	1,706	1,652	1,693	1,779

TABLE 7
CASES OF GYNECOLOGIC CANCER TREATED OR UNDER OBSERVATION
DURING EACH OF YEARS FROM 1957 THROUGH 1973

	<i>Total Patients Followed</i>	<i>The Presbyterian Ward</i>	<i>Private</i>	<i>Francis Delafield</i>
1957	1,950	850	696	404
1958	1,883	853	612	418
1959	1,945	920	618	407
1960	2,248	1,084	696	468
1961	2,384	1,180	732	472
1962	2,601	1,319	801	481
1963	2,851	1,527	783	541
1964	3,198	2,752	852	594
1965	3,633	2,015	930	688
1966	3,581	2,282	850	449
1967	3,577	2,301	901	375
1968	2,396	1,281	742	373
1969	2,110	1,045	817	248
1970	2,003	966	752	285
1971	2,169	1,095	779	295
1972	1,996	966	780	250
1973	2,040	985	805	250

Submitted January 1974.

1973 Publications

Obstetrics and Gynecology

Allderdice, P. W.; Dev, V. G.; Miller, D. A.;

Jagiello, G. M.; Miller, O. J. and Hutton, J. J.

Meiotic confirmation of the identification of chromosomes 9 and 13 in T(9;19)163H, T(5;13)264 Ca, and T(1;13)70H stocks in *Mus musculus*. *Chromosome (Berl.)* 41:103, 1973.

Allderdice, P. W.; Miller, O. J.; Miller, D. A.;

Warburton, D.; Pearson, P. L.; Klein, G. and Harris, H.

Chromosome analysis of two related heteroploid mouse cell lines by quinacrine fluorescence. *J. Cell Sc.* 12:263, 1973.

Allderdice, P. W.; Miller, O. J.; Pearson, P. L.;

Klein, G. and Harris, H.

Human chromosomes in 18 man-mouse somatic hybrid cell lines analysed by quinacrine fluorescence. *J. Cell. Sc.* 12:809, 1973.

Amin, H. K. and Neuwirth, R. S.

Further experience with laparoscopic sterilization concomitant with vacuum curettage for abortion. *Fertil & Steril.* 24:592, 1973.

Blackwood, C. E.; Hosannah, Y.; Perman, E.;

Keller, S. and Mandl, I.

Experimental emphysema in rats: Elastolytic titer of inducing enzyme as determinant of the response. *Proc. Soc. Exper. Biol. & Med.* 144:450, 1973.

Bransilver, Belinda R.; Ferenczy, Alex and

Richart, Ralph M.

Female genital tract remnants. An ultrastructural comparison of hydatid of Morgagni and mesonephric ducts and tubules. *Arch. Path.* 96:255, 1973.

Castellana, Frank S. and Kelly, William G.

Elution gradients generated under hydrostatic equilibrium employing various devices and solvents of different density. *J. Chromatograph. Sc.* 11:429, 1973.

Dev, Vaithilingam G.; Miller, Dorothy A. and

Miller, Orlando J. (Members of the Committee for a Standardized Karyotype of *Rattus norvegicus*)

Standard karyotype of the Norway rat, *Rattus norvegicus*. *Cytogenet. Cell Genet.* 12:199, 1973.

Dev, V. G.; Miller, D. A.; Miller, O. J.;

Marshall, Jr., J. T. and Hsu, T. C.

Quinacrine fluorescence of *Mus cervicolor* chromosomes. Bright centromeric heterochromatin. *Exper. Cell Res.* 79:475, 1973.

Evans, H. E.; Keller, S. and Mandl, I.

Serum trypsin inhibitory capacity and the idiopathic respiratory distress syndrome. *J. Pediat.* 81:588, 1972.

Ferenczy, Alex and Richart, Ralph M.

Scanning electron microscopic study of normal and molar trophoblast. *J. Gynec. Oncol.* 1:95, 1972.

Scanning electron microscopy of the cervical transformation zone. *Am. J. Obs. & Gynec.* 115:151, 1973.

Scanning electron microscopy of hyperplastic and neoplastic endometria. In: *Scanning Electron Microscopy/1973 (Part III). Proceedings of the Workshop on Scanning Electron Microscopy in Pathology*, IIT Research Institute, Chicago, Illinois, April 1973. p. 613.

Scanning and transmission electron microscopy of the human endometrial surface epithelium. *J. Clin. Endocrinol.* 36:999, 1973.

- Ferin, M.; Khalaf, S.; Warren, M.; Dyrenfurth, I.; Jewelewicz, R.; White, W. and Vande Wiele, R. L.
Effects of continuous infusions of synthetic LH releasing hormone (LRH) in Rhesus monkeys. Endocrine Society Meeting, Chicago, June 1973 (abstract).
- Freda, Vincent J.
Hemolytic disease. *Clin. Obst. & Gynec.* 16:72, 1973.
- Frick, II, Henry Clay; Munnell, Equinn W.; Richart, Ralph M.; Berger, Agnes P. and Lawry, Margaret F.
Carcinoma of the endometrium. *Am. J. Obst. & Gynec.* 115:663, 1973.
- Gardstein, Jr., Henry F.; Ferenczy, Alex and Richart, Ralph M.
Asymptomatic bilateral ovarian infarction and venous thrombosis. *Am. J. Obst. & Gynec.* 116:1164, 1973.
- Glass, Leonard; Rajegowda, B. K.; Mukherjee, T. K.; Roth, Michael and Evans, Hugh E.
Effect of heroin on corticosteroid production in pregnant addicts and their fetuses. *Am. J. Obst. & Gynec.* 117:416, 1973.
- Hall, Robert E.
The Supreme Court decision on abortion. *Am. J. Obst. & Gynec.* 116:1, 1973.
- Halpin, Thomas F.; Frick, II, Henry Clay and Munnell, Equinn W.
Critical points of failure in the therapy of cancer of the cervix. A reappraisal. *Am. J. Obst. & Gynec.* 114:755, 1972.
- Hembree, W. C.; Ehrenkaufer, R. E.; Lieberman, S. and Wolf, A. P.
A general method of tritium labeling of utilizing microwaves discharge activation of tritium gas. Methodology and application to biologic compounds. *J. Biol. Chem.* 248:5532, 1973.
- Hochberg, R. B.; Ladany, S. and Lieberman, S.
Cholesterol sulfate: Some aspects of its biosynthesis and uptake by tissues from blood. *Endocrinology* 93:1125, 1973.
- Hochberg, R. B.; McDonald, P. D.; Feldman, M. and Lieberman, S.
Studies on the biosynthetic conversion of cholesterol into pregnenolone: III. Sidechain cleavage of some 20-para-tolyl analogs of cholesterol and 20 α -hydroxy. *J. Biol. Chem.* 248:8218, 1973.
- Jagiello, Georgiana
Book review: *Oögenesis*, edited by Biggers and Schuetz. *J. Med. Genet.*, London, 1973.
- Jagiello, Georgiana and Ducayen, Mercedes
Meiosis of ova from polyovular (C⁵⁸/J) and polycystic (C⁵⁷/L/J) strains of mice. *Fertil. & Steril.* 24:10, 1973.
- Jagiello, Georgiana; Ducayen, Mercedes and Lin, L. S.
Meiosis suppression by caffeine in female mice. *Molec. gen. Genet.* 118:209, 1972.
- A meiotic cytogenetic study in mice of a commonly used tranquilizer reported to concentrate in mammalian follicular fluid. *Teratology* 7:17, 1973.
- Jagiello, G. M.; Ducayen, M. B.; Miller, W. A.; Lin, J. S. and Fang, L. S.
A cytogenetic analysis of oocytes from *Macaca mulatta* and *nemestrina* matured *in vitro*. *Humangenetik* 18:117, 1973.
- Jagiello, G. and Lin, L. S.
An assessment of the effects of mercury on the meiosis of mouse ova. *Mutation Res.* 17:93, 1972.
- Studies on the process of mouse meiosis and ovulation with Daunomycin. *Experientia* 29:114, 1973.
- Jewelewicz, R.; Dyrenfurth, I.; Warren, M.; Joshi, U. and Vande Wiele, R. L.
Factors involved in the maintenance and regression of the corpus luteum of women. In: *Colloques de la Société Nationale Pour L'Etude de la Fécondité*, Paris, Masson et Cie., 1973, p. 353.
- Jewelewicz, Raphael; Dyrenfurth, I.; Warren, M. P. and Vande Wiele, R. L.
Ovarian hyperstimulation syndrome—relationship between preovulatory estrogen levels and ovarian hyperstimulation in gonadotropin-treated patients. *Excerpta Medica, Amsterdam, International Congress Series No. 206*, Eugenia Rosenberg, Editor, ISBN 90 219 0219 2, p. 235.
- Katz, F. H.; Romfh, P.; Zimmering, P. E. and Kelly, W. G.
Radioimmunoassay of plasma aldosterone: Effect of sexual differences and increasing duration of upright posture. *Steroids Lipids Res.* 3:90, 1972.
- Kelly, William G. and Rizkallah, Tawfik
Dissimilar isotopic ratios in urinary estrogens following simultaneous injection of Δ^4 androstenedione-¹⁴C and estrone-6, 7-³H. *J. Clin. Endocrinol.* 26:196, 1973.
- Kino, Isamu; Richart, Ralph M. and Lattes, Raffaele
Nuclear DNA in salivary gland tumors. I. Warthin tumors, benign mixed tumors and mucoepidermoid carcinomas. *Arch. Path.* 95:245, 1973.
- Nuclear DNA in salivary gland tumors. II. Adenocystic carcinomas. *Arch. Path.* 95:325, 1973.
- Levine, Richard U. and Neuwirth, Robert S.
Simultaneous laparoscopy and hysteroscopy for intrauterine adhesions. *Obst. & Gynec.* 42:441, 1973.
- Lewis, J. L.; Nordqvist, S. R. B. and Richart, R. M.
Studies of nuclear DNA in vaginal adenosis and clear-cell adenocarcinoma. *Am. J. Obst. & Gynec.* 115:737, 1973.
- Ludwig, Arthur S.; Okagaki, Takashi; Richart, Ralph M. and Lattes, Raffaele
Nuclear DNA content of lobular carcinoma in situ of the breast. *Cancer* 31:1553, 1973.
- Maheswaran, C. and Neuwirth, R. S.
An unusual case of postpartum fever. Acute hematogenous tuberculosis. *Obst. & Gynec.* 41:765, 1973.
- Miller, D. A.; Allderdice, P. W.; Kouri, R. E.; Dev, V. G.; Grewal, M. S.; Miller, O. J. and Hutton, J. J.
Quinacrine fluorescent chromosome analysis of the Snell translocation in the mouse. *Genetics* 71:633, 1972.

- Miller, Dorothy A.; Dev, Vaithilingam G.; Borek, Carmia and Miller, Orlando J.
The quinacrine fluorescent and Giemsa banding karyotype of the rat, *Rattus norvegicus*, and banded chromosome analysis of transformed and malignant rat liver cell lines. *Cancer Res.* 32:2375, 1972.
- Miller, Dorothy A. and Miller, Orlando J.
Chromosome mapping in the mouse. *Science* 178:949, 1972.
- Miller, O. J.
The karyotype and chromosome map of the mouse. In: *Nobel Symposium XXIII. Chromosome Identification, Techniques and Applications in Biology and Medicine*, 1973, p. 132.
Chromosome identification and analysis of heterogeneity in heteroploid and hybrid cell lines. In: *Symposia Medica Hoechst 6, Modern Aspects of Cytogenetics: Constitutive Heterochromatin in Man*, 1973, p. 225.
Heterochromatin visualized by various techniques. In: *Modern Aspects of Cytogenetics: Constitutive Heterochromatin*, Symposium SchloB Reinhartshausen/Rein, June 18th-20th, 1972, Stuttgart, F. K. Schattauer Verlag, 1973, p. 135.
- Miller, O. J.; Miller, D. A. and Warburton, D.
Application of new staining techniques to the study of human chromosomes. In: *Progress in Medical Genetics*, New York, Grune & Stratton, 1973, Vol. 9, p. 1.
- Miller, Wayne A. and Jagiello, Georgiana
Gonadotropin dependency of isolated ovine ovarian follicles cultured in vitro. *Fertil. & Steril.* 24:609, 1973.
- Myers, Ronald E.; Mueller-Heubach, Eberhard and Adamsons, Karlis
Predictability of the state of fetal oxygenation from a quantitative analysis of the components of late deceleration. *Am. J. Obst. & Gynec.* 115:1083, 1973.
- Naylor, A. F.; Warburton, D. and Warburton, F. E.
Spatial relations of human chromosomes identified by quinacrine fluorescence at metaphase. *Humangenetik* 18:307, 1973.
- Neuwirth, Robert S.
Hysteroscopy: Present and potential applications. *Hosp. Practice* 8:141, 1973.
Book review: *Female Sterilization: Prognosis for Simplified Outpatient Procedures*, edited by G. W. Duncan, et al. New York, Academic Press, 1972. *Family Planning Perspectives*, 1973.
- Neuwirth, Robert S.; Casthely, Sosthene and Kim, Ye-Hum
Tubal pregnancy following application of tantalum clips at culdoscopy for sterilization. *Am. J. Obst. & Gynec.* 114:1066, 1972.
- Neuwirth, Robert S.; Levine, Richard U. and Richart, Ralph M.
Hysteroscopic tubal sterilization. I. A preliminary report. *Am. J. Obst. & Gynec.* 116:82, 1973.
- Parker, R. J.; Allderdice, P. W.; Miller, O. J. and Schildkraut, C. L.
Replication pattern and quinacrine fluorescence of the chromosomes of a CV-1 derived African green monkey cell line. *Cytogenet. Cell Genet.* 12:93, 1973.
- Podoba, V.; Rizkallah, Tawfik and Kelly, William G.
Radioimmunoassay for estrogens in maternal blood in late pregnancy: Values for normal and complicated pregnancy. *Am. J. Obst. & Gynec.* 117:321, 1973.
- Richart, R. M.; Taylor, H. C. and Neuwirth, R. S.
Experimental studies of fallopian tube blockage. In: *Human Sterilization*, R. M. Richart and D. Prager, editors, Springfield, Illinois, Charles C Thomas, 1972, p. 360.
- Santomauro, Anthony G.; Sciarra, John J. and Varma, André
A clinical investigation of the role of the semen analysis and postcoital test in the evaluation of male infertility. *Fertil. & Steril.* 23:245, 1972.
- Schreck, R. R.; Warburton, D.; Miller, O. J.; Beiser, S. M. and Erlanger, B. F.
Chromosome structure as revealed by a combined chemical and immuno-chemical procedure. *Proc. Nat. Acad. Sci. (USA)* 70:804, 1973.
- Shapiro, Lawrence R. and Warburton, Dorothy
Interstitial translocation in man. *The Lancet*, 1972, p. 712.
- Simon, Roberta S. and Richart, Ralph M.
Nuclear DNA content of the normal and hypertrophied myocardium in the pediatric age group. *J. Pediat.* 83:445, 1973.
- Speert, Harold
Iconographia Gyniatrica: A Pictorial History of Gynecology and Obstetrics, Philadelphia, F. A. Davis Co., 1973.
- Tchang, Felix; Okagaki, Takashi and Richart, Ralph M.
Adenocarcinoma of Bartholin's gland associated with Paget's disease of vulvar area. *Cancer* 31:221, 1973.
- Vande Wiele, R. L. and Dyrenfurth, I.
Gonadotropin-steroid interrelationships. *Pharmacol. Rev.* 25:189, 1973; also published in: *New York Heart Association Symposium on Immunopharmacology*, M. deV. Cotten, editor, Baltimore, Williams & Wilkins Co., 1973, p. 189.
- Wang, Jack; Pierson, Jr., R. N. and Kelly, W. G.
A rapid method for the determination of deuterium oxide in urine: Application to the measurement of total body water. *J. Lab. & Clin. Med.* 82:170, 1973.
- Warburton, Dorothy; Henderson, Ann S.; Shapiro, Lawrence R. and Hsu, Lillian Y. F.
A stable human dicentric chromosome, t dic (12;14) (p13;p13) including an intercalary satellite region between centromeres. *Am. J. Human Genet.* 25:439, 1973.
- Warren, Michelle P.
Invited review. Metabolic effects of contraceptive steroids. *Am. J. Med. Sc.* 256:4, 1973.
Metabolic effects of contraceptive steroids. *Am. Rev. Med. Sc.* 264:5, 1973.
- Warren, M. P. and Vande Wiele, R. L.
Clinical and metabolic features of anorexia nervosa. *Am. J. Obst. & Gynec.* 117:435, 1973.
- Yeh, M. N.; Morishima, H. O. and James, L. S.
Myocardial conduction defects and fetal bradycardia. (Abstract.) *Pediat. Res.* 7:299, 1973.
- Zimmerman, Earl A.; Carmel, Peter W.; Husain, M. Kazim; Ferin, Michel; Frantz, Andrew G. and Robinson, Alan G.
Secretion of neurophysin and vasopressin in hypophyseal portal blood in monkeys. Endocrine Society Meeting, Chicago, June 1973 (abstract).

Ophthalmology

A. GERARD DE VOE

Harkness Professor and Chairman of the Department • Director of Service

During 1973 the basic teaching program at both undergraduate and graduate levels, in general, followed the format established in 1972. In keeping with the Medical Center's increasing involvement in community problems, the Department undertook supervision of the Eye Service at Harlem Hospital, with Dr. R. Linsy Farris serving as full-time director, six attending surgeons from the Eye Service providing supervisory control of clinical matters, and one resident from the Eye Institute rotating on a three-month basis. The desirability and effectiveness of this affiliation are to be reviewed annually.

The Department took cognizance of the increasing demand for postgraduate education in several ways. This year our Annual Alumni Meeting, which has been open to the ophthalmic public, attracted about 250 attendants for a well-received three-day program. A similar program on complications of ocular surgery is being planned for the following year. Dr. D. Jackson Coleman gave a course in Ultrasonic Tonography of the Eye and Orbit for approximately 40 people; Dr. Francis A. L'Esperance gave a two-day course on Argon Laser Photocoagulation, which was attended by 50 individuals with primary interest in retinal disease.

Members of the Department have always been active in postgraduate teaching. This is exemplified by the activities of the staff at the Annual Meeting of the American Academy of Ophthalmology and Otolaryngology, held this year in Dallas, Texas. This largest of ophthalmic meetings is primarily devoted to postgraduate teaching exercises. Seven members

of the staff participated in courses ranging from basic scientific aspects of ocular problems to the management of common eye diseases.

Staff Changes

After 41 years as staff artist, Mr. Emil G. Bethke retired this year. His unique talents, which have required not only the abilities of a gifted artist but thorough familiarity and practice with ophthalmic instruments, will be difficult if not impossible to replace.

New Members of the Staff

Dr. William A. James, Jr., a graduate of our residency program, was appointed Assistant in Ophthalmology. Dr. Andrzej Szechter was appointed Staff Associate, and Drs. David G. Harper, John C. Stuart, and Albert J. Hofeldt accepted Visiting Fellowships. Drs. Jesse Sigelman, Lawrence G. Pape, and Bart P. Ketover are new appointees to the resident staff.

Honors

Dr. Charles A. Perera retains his position as chairman of the Research and Grant Committee of the National Society to Prevent Blindness, as does Dr. Harold F. Spalter as secretary of Research to Prevent Blindness. Dr. Arthur Gerard DeVoe has completed his term as president of the American Ophthalmological Society and remains a Regent of the American College of Surgeons and Consultant to the American Board of Ophthalmology. Miss Sally Moore remains president of the American Associa-

tion of Certified Orthoptists with Miss Lynn Stockbridge as secretary.

Dr. Algernon B. Reese received one of the highest awards in ophthalmology, the Trustees Award of the Research to Prevent Blindness, Inc. for outstanding ophthalmic achievement. This was a most fitting acknowledgment of the accomplishments, both scientific and clinical, of this most distinguished member of our staff. He was also Guest of Honor at the American Academy of Ophthalmology and Otolaryngology Meeting in Dallas, Texas.

Dr. Laszlo Z. Bito is a member of the Visual Sciences Study Section (A) of the National Institutes of Health, Division of Research Grants.

Research Activities

Dr. Ethel I. Anderson, with Dr. Jorge Fischbarg, investigating the function of the corneal endothelium, showed that it is not reduced glutathione (GSH) but oxidized glutathione (GSSG) which improves pump function. GSSG appears to have a dual role in corneal endothelial metabolism in that it supports pump function and maintains ATP levels.

Dr. Bito showed that active accumulation of ^3H -prostaglandins by the anterior uvea as well as the choroid plexus and slices of kidney cortex represents a saturable prostaglandin transport system. He demonstrated that during and immediately after acute inflammatory anterior uveitis this ability of the anterior uvea to actively accumulate prostaglandins is greatly inhibited or completely blocked. The significance of this in the etiology and treatment of uveitis, one of the most devastating ocular diseases, is being explored.

Dr. Hernando Cardona, in his keratoprosthesis laboratory, pursued the basic problem of improving prosthesis retention in the human eye. It is now well recognized that this is the only way of restoring vision in certain individuals. New materials, prototypes, and the method of insertion are being studied.

Investigations of glycoprotein in the lens capsule and the lens fibers are being carried out in Dr. Zacharias Dische's laboratory. The ultimate aim of this and Dr. Spector's group is elucidation of the cause of cataract formation and it is hoped, a chemical approach to its cure.

Dr. Fischbarg's main efforts were directed toward elucidating the detailed mechanism by which corneal endothelium transports relatively large amounts of fluid and creates a small electrical potential difference across it.

Evaluation of the importance of the pigmented epithelium for photoreceptor maturation during retinal development was a chief concern of Dr. Joe G.

Hollyfield. He also studied the phagocytic role of the pigmented epithelium.

Dr. Takeo Iwamoto carried out electron microscopic studies on a number of corneal diseases, particularly keratoconus and corneal dystrophy. His chief concern was identification of certain particles noted in the corneal stroma which suggested the possibility of an infecting agent.

In the immunological laboratory Dr. Wladyslaw Manski carried on collaborative research with Drs. Farris, Theresa L. Whiteside, George R. Merriam, Jr., and Andrzej Szechter. These have included studies of the role of competitive inflammatory sites on corneal grafts, examination of cell surface antigens of corneal epithelium and endothelium, and investigation of the mechanism of cataract formation.

Dr. George K. Smelser's research efforts were varied but directed along a central common theme, development of the eye and the functional aspects of some structural components in the adult. With Dr. Tusunetami Nomura he identified the adrenergic endings of nerves supplying the trabecular meshwork in the monkey. With Dr. Yoichi Takei he attempted to determine the chemical nature of the zonula fibers by digesting them with specific enzymes. With Dr. Shigekazu Uga he made a comparative anatomical study of the Mullerian cells of the retina. With Victoria Ozanics, Mary Rayborn, and Dr. Signa Sagun he studied the transient layer of Chievitz in the developing primate retina.

Dr. Abraham Spector's biochemistry group had a very productive year. Dr. Spector showed that there is increasing concentration of high-molecular-weight alpha crystallin in developing senile cataract. With Dr. Jesse Sigelman and Miss Susan Li he demonstrated the appearance of such high-molecular-weight aggregates in the human lens. He studied the mechanism by which alpha crystallin increases in size with age and for the first time indicated how this develops at the molecular level. Drs. John Chen and Gene Lavers continued their work on the mRNA of the lens. Dr. John Stuart joined Dr. Spector for postdoctoral study of corneal collagenases.

Dr. Tadasu Tokumaru is exploring the pathogenesis of ocular viral infections, with particular emphasis on improving viral diagnosis. Efforts this year were centered on radioimmunoassays.

The spectral and adaptational properties of carp photoreceptors were examined by Dr. Paul Witkovsky with Dr. Francis E. Dudek. Physiological and anatomical studies were made with Dr. Hollyfield, of photoreceptors of tadpole eye rudiments grown in culture.

Among the residents Dr. David H. Abramson was

interested in ultrasonic measurements of pilocarpine effects in normal and glaucomatous patients. Additionally, he investigated the histological correlation among lesions of the optic nerve, ocular tumors, and ultrasonic patterns of these diseases.

Dr. Frederick A. Jakobiec, having completed his residency in ophthalmology, is now undertaking a residency program in general pathology prior to beginning an intensive year in ophthalmic pathology at the Armed Forces Institute of Pathology. His research concentrated chiefly on the electron microscopic features of primary orbital tumors.

With Dr. Spector, Dr. Jesse Sigelman studied changes in the human lens with aging and cataract formation. With Dr. Stephen Trokel he developed a method of photographing slit-lamp images of the human lens to demonstrate the relationship between back scattering of light from each region of the human lens to the age and visual acuity of the eye.

Dr. Balachandran D. Srinivasan, with Dr. Iwamoto, studied the ultrastructure of the lens and was active in studying corneal disease.

Drs. Geoffrey G. White and Craig Edmonds spent an elective period studying pediatric ophthalmology at the Children's Hospital in Washington, D. C.

Dr. Guillermo Pico, Jr., spent three months at the University of Puerto Rico in a surgical elective and studied the noncontact tonometer with Dr. Max Forbes.

Dr. Myles M. Behrens continued the clinical teaching and consulting unit developed last year and was aided by an additional fellow, Dr. David Harper. This unit provided much improved instruction in a unique area for residents in both neurology and ophthalmology.

In the Knapp Memorial Laboratory of Physiological Optics Dr. Charles J. Campbell continued clinical studies of a variety of retinal diseases, particularly those of the macula. He investigated the value of cryosurgery in the management of peripheral posterior segment uveitis and pursued an ongoing clinical investigation concerned with reducing the incidence of retinal detachment following cataract surgery. He finished a textbook, *Physiological Optics*, which will be published shortly.

Dr. D. Jackson Coleman's study of the ultrasonic characterization of ocular and orbital pathology yielded new information on the ability of B-scan ultrasound to identify membranous and hemorrhagic changes in the vitreous, eye changes of Graves' disease, and optic nerve changes in optic neuropathy. New techniques involving isodensity color tracing of reflected sound and kinetic sector scanning made useful additions to diagnostic techniques already in use.

Dr. Andrew de Roeth, Jr. studied the effect of cataract extraction on the status of a large number of glaucomatous eyes and is currently investigating the cause of the underlying mechanism of these effects.

The Tumor Clinic, originally developed by Professor Emeritus Algernon B. Reese, accelerated both in volume and activities. Dr. Robert M. Ellsworth's principal research efforts were directed toward elucidating the pleiotropic effects of the retinoblastoma gene. In its genetic form the mutation affects all cells in the body as well as the retinal cells. He postulated that this genetic mutation predisposes children toward the development of other tumors later in life.

The effectiveness of soft contact lenses is being studied by Dr. John W. Espy. His interest is primarily concerned with the value of this modality as a therapeutic measure in corneal disease.

In addition to carrying on his clinical responsibilities as Director of the Eye Service at Harlem Hospital Dr. Farris worked with Dr. Manski on corneal transplantation in inbred rats and studied the value of cautery of Bowman's membrane.

Dr. Frank B. Hoefle acquired the mechanical facilities and technical help to provide frozen donor cornea for use in transplantation procedures. He is also studying the physiological effect of new contact lens materials on cornea *in vitro*.

During the past year Dr. George R. Merriam, Jr., was a member of the Radiobiological Advisory Panel of the Committee on Space Biology and Medicine of the National Academy of Sciences. The work included a survey of the research activities in radiobiology sponsored by N.A.S.A.; recommendations were made. Dr. Merriam completed research on the influence of age on the radiosensitivity of mammalian lens and is about to initiate more basic studies on the mechanisms of development of radiation cataracts.

The Children's Clinic, directed by Dr. Philip Knapp, and supported in large part by Fight-for-Sight, Inc., proved its value. The separation of children from the main adult clinic was well received by both groups. The establishment of a formal fellowship program is being planned in order to take advantage of the excellent teaching material.

Dr. Francis A. L'Esperance, Jr., continued research in an effort to determine the pathologic hemodynamics of various chorioretinal diseases. Instrumentation was developed for pressure measurement in the various retinal vessels as well as for determination of density and perfusion of blood in the macular area. It is hoped that this will permit reclassification of macular disease on a hemodynamic

basis as well as evaluation of the results of various forms of treatment.

Dr. Harold F. Spalter was associated with the Hypertension Center Study, particularly emphasizing the ocular manifestations of systemic hypertension. With Dr. Jakobiec he undertook a study of the fluorescein characteristics of hypertensives throughout the natural history of the disease. He continued his long-term survey with Dr. Jerry Jacobs (Pediatrics) on ocular manifestations of juvenile rheumatoid arthritis.

For a number of years Dr. Emil Wirostko has been concerned with the characterization and isolation of a possible infectious agent in uveitis. The experimental animal appears a possible model for the study of human disease. His studies indicate an association of uveitis with a gamut of systemic inflammatory diseases, a fact which again suggests the possibility of infectious idiology.

Clinical Activities

As a direct result of technological advances which have not only reduced the necessity for prolonged hospital stay but in many cases have eliminated it entirely, the problem of bed occupancy arose and may require structural changes in the Eye Institute; most other departments of ophthalmology also confront this difficulty. The total number of clinic visits rose to 25,701 patients, as compared with 23,605 visits in 1972. In all, 5,427 visits were recorded in the Children's Eye Clinic as compared with 5,202 in 1972. During 1973 3,827 patients were hospitalized for 24,865 days, as compared with 3,270 patients and 23,840 patient days in 1972. Operative procedures totaled 4,173 in 1973.

Through the generosity of Mr. and Mrs. Henry Gaisman the renovation of the Eye Institute library is complete and the library is now in operation. This remains one of the largest, most comprehensive eye libraries in the world.

Members of the Eye Institute recognize that teach-

ing and lecturing are among their important duties. They have taken part in lectures, symposia and teaching exercises too numerous to recount.

During the past year Dr. Richard W. Darrell organized an External Eye Disease Clinic and developed a series of 15 one-hour lectures on the subject.

The Department of Radiology at the Edward S. Harkness Eye Institute was developed to a high state of competence by Dr. Stephen L. Trokel with the great help of the Neuroradiological Division of the Department of Radiology.

The Orthoptic Department completed its 24th year of operation under the direction of Miss Sally Moore and Miss Lynn Stockbridge. The two-year course for Orthoptists and Ophthalmic Assistants has two students in each year of the program. The Orthoptics group is active not only in evaluating extraocular muscle problems clinically but is most active in teaching of residents and third-year medical students.

Acknowledgments

We acknowledge with deep gratitude contributions from the following sources: American Optical Company, Arkwright Manufacturing, Inc., Marion R. Ascoli Fund, Max Ascoli Fund, Robert Sterling Clark Foundation, Inc., Max B. Cohn Family Foundation, Caleb C. & Julia Dula Educational & Charitable Foundation, Dr. John H. Dunnington, Fight for Sight, Inc., Raymond R. Guest, Mr. and Mrs. Henry J. Gaisman, Polly & Gilbert Kahn Foundation, Inc., Knights Templar Eye Foundation, Mr. George F. Knochel, Herbert & Rita Merin Foundation, Inc., National Institutes of Health, The Overbrook Foundation, estate of Alexander Peacock, estate of Jean Peacock, Mr. Julian R. Quinn, Research to Prevent Blindness, Inc., Dudley Roberts Foundation, Seth Sprague Educational & Charitable Foundation, and John L. Weinberg Foundation.

1973 Publications

Ophthalmology

- Abrahamson, David H.
Bigeminy and heroin intoxication. *New York J. Med.* 72:2888-2890, 1972.
Latent nystagmus in identical twins. *Arch. Ophthalm.* 89:256-257, 1973.
- Abramson, David H.; Franzen, Louis A. and Coleman, D. Jackson
Pilocarpine in the presbyope. Demonstration of an effect on the anterior chamber and lens thickness. *Arch. Ophthalm.* 89:100-102, 1973.
- Anderson, E. I.; Fischbarg, J. and Spector, A.
Fluid transport, ATP level and ATPase activities in isolated rabbit corneal endothelium. *Biochim. Biophys. Acta* 307:557-562, 1973.
- Behrens, M. and Manski, W.
Immunogenic uveitis in inbred rats. Part I. *Ophthalm. Res.* 5:31-40, 1973.
Immunogenic uveitis in inbred rats. II. Ocular response to crystallins and albuminoid in lens-sensitized inbred rats. *Ophthalm. Res.* 5:89-101, 1973.
Immunogenic uveitis in inbred rats. III. Ocular response to crystallins and albuminoid in normal inbred rats. Relevance to clinical lens-induced uveitis. *Ophthalm. Res.* 5:129-136, 1973.
- Bito, Laszlo Z.
Absorptive transport of prostaglandins from intraocular fluids to blood: a review of recent findings. *Exper. Eye Res.* 16:299-306, 1973.
Inhibition of uveal prostaglandin transport in experimental uveitis. In: *Prostaglandins and Cyclic AMP: Biological Actions and Clinical Applications*. R. H. Kahn and E. M. Lands, Academic Press, New York, 1973, p. 213.
- Bito, L.; Roberts, Jane C. and Saraf, S.
Maintenance of normal corneal thickness in the cold *in vivo* (hibernation) as opposed to *in vitro*. *J. Physiol.* 231:71-86, 1973.
- Bito, Laszlo and Salvador, Erica V.
Intraocular fluid dynamics. III. The site and mechanism of prostaglandin transfer across the blood intraocular fluid barriers. *Exper. Eye Res.* 14:233-241, 1972.
- Bito, L. Z. and Saraf, S.
The effects of cold on corneal thickness and on aqueous humor and blood plasma composition of *Rana pipiens*. *Exper. Eye Res.* 16:315-325, 1973.
- Brini, Alfred.
Hypochromia of the rabbit iris induced by 6-hydroxydopamine. *Invest. Ophthalm.* 12:312-313, 1973.
- Brini, A. and Flament, F.
Cataracta glaucomatosa acuta. *Exper. Eye Res.* 16:19-28, 1973.
- Campbell, Charles J. and Wise, George N.
Photocoagulation therapy of branch vein obstructions. *Am. J. Ophthalm.* 75:28-31, 1973.
- Carroll, Frank D.
Optic nerve complications of cataract extraction. *Trans. Am. Acad. Ophthalm. & Otolaryngol.* 77:OP-623-OP-629, 1973.
- Chen, J. H.; Lavers, G. C. and Spector, A.
Synthesis of complementary DNA from lens mRNA with RNA-dependent DNA polymerase. *Biochem. Biophys. Res. Comm.* 52:767, 1973.
- Coleman, D. Jackson
Reliability of ocular tumor diagnosis with ultrasound. *Trans. Am. Acad. Ophthalm. & Otolaryngol.* 77:OP-677-OP-686, 1973.
- Coleman, D. Jackson and Abramson, David H.
Correlation of ultrasonic characteristics and tissue morphology of malignant melanomas. In: *Diagnostica Ultrasonica Ophthalmologica*. M. Massin and J. Poujol, ed. (Proc., 4th Congress of the International Society for Ultrasonic Diagnosis in Ophthalmology, Paris, France, 1971.) 1973, pp. 215-218.
- Coleman, D. Jackson and Carroll, Frank D.
Evaluation of optic neuropathy with B-scan ultrasonography. *Am. J. Ophthalm.* 74:915-920, 1972.
A new technique for evaluation of optic neuropathy. *Trans. Am. Ophthalm. Soc.* 70:154-163, 1972.
- Coleman, D. Jackson and Jack, Robert L.
B-scan ultrasonography in diagnosis and management of retinal detachments. *Arch. Ophthalm.* 90:29-34, 1973.
- Coleman, D. Jackson; Jack, Robert L. and Franzen, Louise A.
B-scan ultrasonography of orbital lymphangiomas. *Brit. J. Ophthalm.* 57:193-198, 1973.
Ultrasonography in ocular trauma. *Am. J. Ophthalm.* 75:279-288, 1973.
- Cubberly, Margaret G.
Photography of ultrasound scans in diagnostic ophthalmology. *J. Biolog. Photog. A.* 41:39-46, 1973.
- de Roeth, Andrew, Jr.
Recent advances for the treatment of glaucoma. In: *Proc. International Symposium on Ocular Cryosurgery, Rome, Italy, October, 1970*. Milan, Italy, 1973.
- Dische, Z. and Murty, V. L. N.
Preparation and purification of a structural sialofoglycoprotein from the bovine lens capsule. *Exper. Eye Res.* 16:151-166, 1973.
- Ellsworth, Robert M.
Tumors of the eye. In: *Cancer Medicine*, J. F. Holland and E. Frei, III, ed. Lea & Febiger, Philadelphia, 1973, pp. 1425-1436.
Tumors of the retina. In: *Retinal Diseases in Children*. W. Tasman, ed. Harper & Row, Hagerstown, Md., 1973, pp. 39-58.
- Farris, R. Linsy
Common eye disorders in the aged. *Geriatrics* 28:52-53, 1973.
- Ferayorni, J.; Hoeffle, F. B. and Koverman, J. J.
K, q and disc edema with methylmethacrylate contact lenses. *Contact Lens Med. Bull.* 6:23-24, 1973.

- Fischbarg, J.
Active and passive properties of the rabbit corneal endothelium. *Exper. Eye Res.* 15:615-638, 1973. (*Proc. of the International Symposium on "Transport in the Eye."* J. A. Zadunaisky, ed. Academic Press, New York, 1973.)
- Fischbarg, J. and Lim, J. J.
Determination of the impedance locus of rabbit corneal endothelium. *Biophys. J.* 13:595-599, 1973.
- Hammond, E. Cuyler and Spalter, Harold F.
Survey of needs in ophthalmic research and development. *Am. J. Ophthalm.* 76:389-394, 1973.
- Hoefle, Frank B. and Koverman, James J.
Corneal edema with soft contact lenses—in vivo and in vitro physiological studies. In: *Symposium on the Flexible Lens*, Joseph L. Bitonte and Richard H. Keates, C. V. Mosby Co., St. Louis, 1972, pp. 176-180.
- Hoefle, F. B.; Maurice, D. M. and Sibley, R. C.
Methods of evaluating corneal donor material. In: *Corneal Preservation; Clinical and Laboratory Evaluation of Current Methods*. J. A. Capella, H. F. Edelhauser, and D. L. Van Horn, ed. Charles C. Thomas, Springfield, Ill., 1973, pp. 96-108.
- Hollyfield, Joe G.
Elimination of egg pigment from developing ocular tissues in the frog *Rana pipiens*. *Develop. Biol.* 30: 115-128, 1973.
- Howard, George M.
The lids, lacrimal apparatus and orbit. In: *The Year Book of Ophthalmology 1972*. William F. Hughes, ed. Year Book Medical Publishers, Chicago, 1973, pp. 5-23.
- Iwamoto, Takeo; Jones, Ira Snow and Howard, George M.
Ultrastructural comparison of spindle A, spindle B, and epithelioid-type cells in uveal malignant melanoma. *Invest. Ophthalm.* 11:873-889, 1972.
- Iwamoto, Takeo; Reese, Algernon B. and Mund, Michael L.
Tapioca melanoma of the iris. Part 2. Electron microscopy of the melanoma cells compared with normal iris melanocytes. *Am. J. Ophthalm.* 74:851-861, 1972.
- Jack, Robert L. and Coleman, D. Jackson
Detection of retinal detachments secondary to choroidal melanoma with B-scan ultrasound. *Am. J. Ophthalm.* 74:1057-1065, 1972.
Diagnosis of retinal detachment with B-scan ultrasound. *Canad. J. Ophthalm.* 8:10-18, 1973.
- Kaye, Gordon I.; Hoefle, Frank B. and Donn, Anthony
Studies on the cornea. VIII. Reversibility of the effects of *in vitro* perfusion of the rabbit corneal endothelium with calcium-free medium. *Invest. Ophthalm.* 12:98-113, 1973.
- Kaye, Gordon I.; Sibley, Riley C. and Hoefle, Frank B.
Recent studies on the nature and function of the corneal endothelial barrier. *Exper. Eye Res.* 15:585-613, 1973.
- Knapp, Philip
The surgical treatment of persistent squint. *Documenta Ophthalm.* 34:221-228, 1973.
- Koverman, James J. and Hoefle, Frank B.
Corneal edema with small, thin, methylmethacrylate contact lenses—Clinical studies. In: *Symposium on the Flexible Lens*, Joseph L. Bitonte and Richard H. Keates, ed. C. V. Mosby Co., St. Louis, 1972, pp. 176-180.
- Koverman, J. J.; Hoefle, F. B. and Buxton, J. N.
Contact lenses in keratoplasty. In: *Symposium on Contact Lenses. Transactions of the New Orleans Academy of Ophthalmology*. C. V. Mosby Co., St. Louis, 1973, pp. 113-117.
- L'Esperance, Francis A.
Argon laser photocoagulation of diabetic retinal neovascularization (a five-year appraisal). *Trans. Am. Acad. Ophthalm. & Otolaryngol.* 77:OP-6-OP-24, 1973.
Argon laser photocoagulation of diabetic retinal neovascularization. *Highlights Ophthalm.* 14:49-60, 1972-73 Series.
- Hemobarometry. Preliminary report of a new diagnostic technique. *Am. J. Ophthalm.* 75:266-278, 1973.
- Li, Lu-Ku and Spector, Abraham
The reaggregation of purified subunits of alpha-crystallin. *Exper. Eye Res.* 15:179-183, 1973.
- Matsuda, Hidehiko and Smelser, George K.
Endothelial cells in alkali-burned corneas. *Arch. Ophthalm.* 89:402-409, 1973.
Epithelium and stroma in alkali-burned corneas. *Arch. Ophthalm.* 89:396-401, 1973.
- Moore, S.
The orthoptist of the future (Editorial). *Am. Orthop. J.* 23:80-81, 1973.
- Moore, Sally and Stockbridge, Lynn
Another approach to the treatment of accommodative spasm. *Am. Orthop. J.* 23:71-72, 1973.
- Redler, Lance D. and Ellsworth, Robert M.
Prognostic importance of choroidal invasion in retinoblastoma. *Arch. Ophthalm.* 90:294-296, 1973.
- Reese, Algernon B.; Mund, Michael L. and Iwamoto, Takeo
Tapioca melanoma of the iris. Part 1. Clinical and light microscopy studies. *Am. J. Ophthalm.* 74:840-850, 1972.
- Smelser, George K.; Ozanics, Victoria; Rayburn, Mary and Sagun, Digna
The fine structure of the retinal transient layer of Chievitz. *Invest. Ophthalm.* 12:504-519, 1973.
- Spalter, Harold F.
Treatment of exudative diabetic maculopathy. *Highlights Ophthalm.* 14:36-43, 1972-1973 Series.
Photocoagulation of diabetic maculopathy. In: *Modern Problems in Ophthalmology*, vol. 10. S. Karger, Basel, 1972, pp. 609-617.
- Spector, Abraham
The aging of alpha-crystallin: A review. *Exper. Eye Res.* 16:115-121, 1973.
- Spector, Abraham and Rothschild, Carl
The effect of calcium upon the reaggregation of bovine alpha crystallin. *Invest. Ophthalm.* 12:225-231, 1973.

- Spector, A.; Stauffer, J., and Sigelman, J.
Preliminary observations upon the protein chemistry of the human lens. In: *CIBA Symposium on the Lens*. CIBA, London, 1973.
- Srinivasan, B. D. and Iwamoto, Takeo
Electron microscopy of rabbit lens nucleoli. *Exper. Eye Res.* 16:9-18, 1973.
- Stell, W. K. and Witkovsky, P.
Retinal structure in the smooth dogfish, *Mustelus canis*; general description and light microscopy of giant ganglion cells. *J. Comp. Neurol.* 148:1-32, 1973.
Retinal structure in the smooth dogfish, *Mustelus canis*; light microscopy of photoreceptors and horizontal cells. *J. Comp. Neurol.* 148:33-46, 1973.
- Trokkel, Stephen L.
Annual review. The orbit. *Arch. Ophthalm.* 89:152-162, 1973.
Orbital tumors. In: *Neurological Surgery*, vol. 3. W. B. Saunders Co., Philadelphia, 1973, pp. 1275-1296.
- Tamura, T. and Smelser, G. K.
Development of the sphincter and dilator muscles of the iris. *Arch. Ophthalm.* 89:332-339, 1973.
- Tjga, Shigekazu and Smelser, George K.
Comparative study of the fine structure of retinal Müller cells in various vertebrates. *Invest. Ophthalm.* 12:434-448, 1973.
Electron microscopic study of the development of retinal Müllerian cells. *Invest. Ophthalm.* 12:295-307, 1973.
- Vrabec, F.
Encapsulated sensory corpuscles in the sclerocorneal boundary tissues of the killer whale *Orcinus orca* L. *Acta Anat.* 81:32-39, 1972.
- Wheeler, Maynard C.
Long-term results of the surgical treatment of strabismus. *J. Pediat. Ophthalm.* 9:76-78, 1973.
- Whitelocke, Rodger A. F. and Eakins, Kenneth E.
Vascular changes in the anterior uvea of the rabbit produced by prostaglandins. *Arch. Ophthalm.* 89:495-499, 1973.
- Witkovsky, P.; Nelson, J. and Ripps, H.
Action spectra and adaptation properties of carp photoreceptors. *J. Gen. Physiol.* 61:401-423, 1973.
- Witkovsky, P. and Stell, W. K.
Retinal structure in the dogfish, *Mustelus canis*; light microscopy of the bipolar cells. *J. Comp. Neurol.* 148:47-60, 1973.
Retinal structure in the smooth dogfish, *Mustelus canis*; electron microscopy of serially sectioned bipolar cell synaptic terminals. *J. Comp. Neurol.* 150:147-168, 1973.
- Witkovsky, P.; Zeigler, H. P. and Silver, R.
The nucleus basalis of the pigeon; a single unit analysis. *J. Comp. Neurol.* 147:119-128, 1973.
- Zipf, Richard F. and Trokel, Stephen L.
Simulated superior oblique tendon sheath syndrome following orbital floor fracture. *Am. J. Ophthalm.* 75:700-705, 1973.

Orthopaedic Surgery

FRANK E. STINCHFIELD

Professor and Chairman of the Department • Director of Service

The year 1973 found the Orthopaedic Service busier than ever. At no time was a decrease noted in the numbers of clinic, ward, semiprivate, or private patients. With the opening of the new Emergency Service and the arrival of many more ambulance patients, every available bed was utilized. A scoliosis service and a total joint implant service were established in the same manner as the hand service. A laminar air flow room was installed in one of the orthopaedic operating rooms for total joint implant surgery.

With the advent of professional standards review organizations, the utilization committees, the establishment of audit committees and adherence to Public Law 92-603, more paper work than ever before is necessary in Department administration.

With the drastic decrease in funds available from the Government for research, it was necessary to terminate some research and obtain from private individuals the funds needed for those continued projects. For their generous provision of the funds needed to continue essential research programs, we are deeply grateful to these individuals.

With the absolute necessity to save money in the administration of a large facility such as Columbia-Presbyterian Medical Center and the increasing need to provide better care for the seriously ill, a paradoxical situation emerges: Although expenses of providing proper care constantly increase, the funds available decline as inexorably.

Probably the most urgent need in the Department is a special care unit for seriously ill patients return-

ing from the operating room or transferred from intensive care units.

Recruitment of adequately high quality new staff is essential, and to that end two new attendings will be added to our staff in the coming year. During 1973 Dr. Wilfred Krom resigned to return to practice in California and Dr. Robert S. Mathews, to practice in Pennsylvania.

A portion of the teaching of second-year orthopaedic surgery continued to be conducted at St. Luke's Hospital under the able direction of Dr. J. William Fielding and staff.

Our fourth-year elective program continued with exposure to clinical and operative orthopaedic surgery, research in musculoskeletal trauma, and anatomy and surgical trauma at the Medical Center and at St. Luke's and Roosevelt Hospitals.

Dr. C. Andrew L. Bassett was selected for inclusion in *Who's Who in the World*, and was recipient of the 1973 Annual Award of the Research Society of America for outstanding research. He served as a member of the Research Advisory Committee of the American Academy of Surgeons, on the Advisory Editorial Board of *Calcified Tissue Research*, a Chairman of the Medical Devices Advisory Committee, Food and Drug Administration, D.H.E.W., on the Board of Scientific Advisors, (A/O) Schweizerischen Arbeitsgemeinschaft für Osteosynthesefragen Bern, Switzerland, and as President, Board of Scientific Advisors, Institute Calot, Berck-Plage France.

Dr. Robert E. Carroll acted as Visiting Professor

University of Djakarta, Java, Indonesia and was appointed President Elect, the New York Society for Surgery of the Hand. Dr. Nas S. Eftekhari was made a member of the Eastern Orthopaedic Association and a fellow in the American College of Surgeons. Dr. Sawnie R. Gaston completed a history of the American Association for the Surgery of Trauma. Dr. S. Ashby Grantham was appointed to the New York State Society of Orthopaedic Surgeons.

Dr. Charles S. Neer II served as Special Guest Lecturer at the 1973 annual meeting of the Pennsylvania Orthopaedic Society and at Harvard University. With Dr. Howard A. Kiernan, Jr., as Resident Chairman, he served as Chairman of the National Residents Conference of the American Orthopaedic Association. He participated in a number of instructional courses for the American Academy of Orthopaedic Surgeons throughout the year and served on various committees of the Academy and the American Orthopaedic Association and the National Committee on Trauma, the American College of Surgeons.

Dr. Marvin L. Shelton was appointed President of the Orthopaedic Section of the New York State Medical Society.

Dr. Frank E. Stinchfield continued as President of the Medical Board of The Presbyterian Hospital. He was awarded the First Distinguished Alumni Visiting Professorship at Northwestern University Medical School and was elected Chairman of the Board of Regents of the American College of Surgeons.

Three students in their elective year participated in the Orthopaedic Research Laboratories under the supervision of Drs. Bassett, Robert W. Rice, and Mr. Robert J. Pawluk. Dr. David Tornberg, who had spent two months in the laboratories last year, returned this year. Working with Drs. Bassett and Rice, he defined the temporal and morphologic sequence of events during periosteal osteogenesis provoked by a potent osteogenic factor (protein-polysaccharide). Using histologic, autoradiographic, and electron microscopic approaches, it was evident that the cellular response occurs mainly in the cambium layer of the periosteum. Following vigorous mitotic activity in the first 24 to 36 hours, collagen and protein polysaccharide synthesis occurs for the remainder of the first week. Mineralization begins during the 48- to 72-hour interval and appears both as collagen-associated seed crystals and vesicle-associated apatite cluster formation. A report of this work is being readied for publication.

Mr. Sherwood McClelland, with Mr. Pawluk and Dr. Bassett, participated in developing and analyzing a simple cortical defect model for osteogenesis in dogs. The effects of a variety of electromagnetic fields

on the spatial distribution, rate, and architectural aspects of osteogenesis were studied. Utilizing radiographic, histologic, and ^{45}Ca techniques, it was established that the healing pattern in a simple cortical defect can be altered significantly with specific types of low-field strength, pulsing electromagnetic fields. These results correlated well with those obtained in a more complex fibular osteotomy model.

Mr. Charles Beaumont is studying the effects of electromagnetic field stimulation on fracture healing in rats with metallic and plastic intramedullary femoral nails. These studies are being conducted under Dr. Bassett's and Mr. Pawluk's supervision. Furthermore, Mr. Beaumont is attempting to determine if such fields can alter the rate or pattern of repair in transected rat sciatic nerves.

The last of the orthopaedic research trainees under the National Institutes of Health Orthopaedic Research Training Grant, formerly the major support for the exposure of selected residents and others to research experience, were Drs. Harshad R. Chokshi and Michael P. Coyle, Jr., and Mrs. Gloria Reinisch. Dr. Coyle completed a year in the laboratory prior to embarking on his orthopaedic residency. Working under Dr. Bassett's supervision, he established a method for producing a fixed scoliotic curve in growing puppies by means of dorsal rhizotomies in the thoracic region. Curves established by this means were used to study the effects of pulsed electrical stimulation of paraspinal musculature at the apex of the curve. Sufficient experience was developed to prove the practicality and feasibility of the method as an approach to correction of scoliosis and forms the basis of a joint clinical study being undertaken with the University of Toronto by Dr. Hugo A. Keim. Dr. Coyle defined the effects of fracture reduction as opposed to reduction and compression on the passive electrical characteristics of fractured bone. Results of the latter studies provide insight into the differing mechanisms in primary and secondary bone healing patterns.

Dr. Chokshi continued to study the effects of electrostatic, electrodynamic, and pulsing electromagnetic fields on collagen and DNA synthesis by cartilage and bone cells in tissue culture. These studies established the need for highly specific "informational" content in the perturbing electrical "signal." Coupled with the *in vitro* studies of changes in amphibian red cell morphology as a result of electrical stimulation, Dr. Chokshi, with Drs. Arthur A. Pilla and Denis Moran, better defined interactions between a cell and its electrical environment.

Mrs. Reinisch continues joint studies in the Orthopaedic Research Laboratories and the School of En-

gineering in preparation for her Ph.D. thesis in bioengineering. It is expected that she will be a candidate for the degree this year. Her highly controlled investigations centered on the piezoelectric properties of bone and the effect of hydration on these and other (passive) electrical properties of bone.

Preliminary findings that fracture repair can be stimulated by surgically noninvasive means have been strengthened. Both electrostatic (capacitively coupled) and electromagnetic (inductively coupled) fields were demonstrated to increase the tempo of fracture repair in rabbits and dogs. The physical, dimensional, and tissue parameters of a variety of electromagnetic and electrostatic fields were defined. As a result, and even with "primitive" electronic circuitry, it is possible to improve repair rates by 25 to 50 per cent. Based on these and other data, a limited clinical trial is to be undertaken this year in Vanderbilt Clinic and the Emergency Services. Further studies of the effects of this type of treatment, with improved circuitry, in congenital pseudarthrosis of the tibia are in progress.

Primarily as a result of a heavy cutback in federal and other research funding, Professor Atle Gjelsvik and Drs. Richard Bray and Moran were forced to leave the laboratories. Their departure robbed the program of expert abilities in the bioengineering and biomechanics, biochemistry, and experimental embryology phases of the laboratory activities. Although these individuals are sorely missed, the basic research programs are sound and provide adequate opportunity for medical student participation in research activities. Furthermore, with the demise of the Orthopaedic Research Training Grant program, the need for supervisory faculty and investigators is somewhat diminished.

Dr. Bassett, who was on Sabbatical leave, was appointed Visiting Scientist at the Medical Research Council, Clinical Research Centre, in Harrow, England. While there, he investigated the effects of electromagnetic fields on experimental sarcomas in mice. Preliminary results indicate a sharp reduction in mortality and tumor size over controls in the field-exposed mice. In addition, several anatomic and morphologic changes were noted in the treated tumors, i.e., encapsulation, a strong stromatization response, a marked increase in reticulin, and more numerous and normal vessels. These microscopic results were corroborated and expanded by means of electron microscopy which indicated, in addition, substantial changes in the fine structure of the treated tumor cells. These studies are being expanded in the Orthopaedic Research Laboratories and, if

consistent findings are obtained, will be extended to clinical trials.

Dr. George B. Ambrose is continuing studies on wound healing, slipped upper femoral epiphyses, and cerebral palsy.

Dr. Carroll continued research on surgery of the hand. Dr. Eftekhari continued a study on fixation total hip devices (optimization) and is developing a new knee simulator to analyze differentiation of motion of the knee, a ball and socket (hinged) prosthesis, and a cylindrical elastic linkage for the knee.

Dr. Alexander Garcia is studying the relationship of retinoblastoma to osteogenic sarcoma with Dr. Charles V. Helming.

Dr. Grantham is continuing research on further development of a femoral supracondylar fixation device with Drs. Neer and Shelton, olecranon fracture in children with Dr. Kiernan, and recurrent dislocation of the patella with Drs. James R. Cole and John H. Bargren.

Dr. Austin D. Johnston (Pathology) is continuing studies on electron microscopy—osteoarthritis and bone tumors and submitted for publication, with Dr. Frieda Feldman (Radiology) a report of a study on axial neuroarthropathy and the Charcot joint.

Dr. Rosamond Kane continued her study on etiological factors in talipes equinovarus.

Dr. Keim is studying the use of spinal pacemakers in the correction of idiopathic (genetic) scoliosis. He presented an exhibit on disseminated intravascular coagulation at the annual meeting of the American Academy of Orthopaedic Surgeons.

Dr. Shelton, with Dr. Stinchfield, designed a prosthetic replacement for the ankle joint to be used in selected arthritic conditions of the adult ankle and is studying mechanical stimulation of bone healing using alternate compression and distraction forces on fractures of the tibia.

Drs. Robert N. Dunn and John R. Denton presented an exhibit on immobilization of difficult fractures at the American Fracture Association.

Members of the resident staff, time allowing, continue to be productive in clinical research.

Acknowledgments

We are extremely grateful for the continued support of our Women's Auxiliary and our many friends, including Mr. Malcolm P. Aldrich, Mr. and Mrs. Joseph Anthony, Mrs. Edward J. Birmingham, Mrs. H. Lawrence Bogert, Dr. Norman J. Cowen, Mrs. Gerald Donovan, Mr. Frederick M. Eaton, Mr. and Mrs. Gustavus Esselen, Mrs. Anne R. Feldman, Mr. Thomas C. Fogarty, Dr. S. Ashby Gran-

tham, Mr. L. Martin Harris, Mr. Harry F. Hertz, Mr. H. H. Hoyt, Miss Marion C. Kenton, Dr. Julian Kirchick, Dr. Raffaele Lattes, Mrs. William G. McGuire, Mr. Charles S. Munson, Jr., Mr. Philip D. Reed, Mr. William R. Salamon, Mrs. Margaret D. Stinchfield, Mrs. DeWitt Wallace, Mr. and Mrs. Harold P. Wilmerding, Chace Foundation, Church & Dwight Co., Deering Millikin Foundation, Depuy Incorporated, ESB Incorporated, Johnson and Johnson, Management Organization, Inc., National Institute of Metabolic and Digestive Diseases, U.S.P.H.S., and the Williams-Adler Foundation.

The 47th annual meeting of the Alumni Association of The New York Orthopaedic Hospital, held on April 13 and 14, was attended by one hundred members. Dr. Harold B. Boyd, Emeritus Professor of Orthopaedic Surgery and member of the Staff at the Campbell Clinic in Memphis, Tennessee, presented the 16th annual Alan DeForest Smith Lecture on the role of fibrous tissue in the prevention of bone formation.

Dr. D. Kay Clawson, Professor and Chairman, Department of Orthopaedics, University of Washington School of Medicine in Seattle, served as Visiting Professor during 1973.

The 17th annual two-week postgraduate course in orthopaedic surgery and pathology was attended by 140 orthopaedic surgeons from throughout the country.

New York State Rehabilitation and Research Hospital

The state legislature allocated money for a 250-bed hospital building, construction of which is under way. With the completion of the new hospital, its clinical services as well as its research facilities will be greatly expanded. In the midst of the expansion plans, the services of the present facility are in greater and greater demand by prospective patients from out-of-state, as well as by residents of outlying areas of New York State. To accommodate the increased census, additions were made in the active attending staff.

Dr. Alice Garrett continues in her dual role as Medical Director of the hospital and Director of Surgical Services. Dr. Robert L. S. Boothe serves as Chief of the Adult Surgical Services, and Dr. Raphael K. Levine was newly appointed as Chief of the Pediatric Surgical Services. Dr. Charles T. Ryder remains active as Chairman of the Medical Board, and, in his role as Senior Consultant in Pediatric Orthopaedics, his teaching is much appreciated. The Meningomyelocele Service expanded greatly under his tutelage. Drs. Harold M. Dick and Keim

developed active Hand and Scoliosis Services, respectively. Dr. Edward M. Wheeler serves as the orthopaedic consultant in the multidisciplinary approach to the arthritis patient. Dr. Edward B. Leahey, with Dr. Rodolfo Reyes (Chief, Rehabilitation Medicine), is responsible for an increasingly active Brace and Prosthetics Clinic. Drs. Leahey and Reyes also continued clinical research in relation to the surgical and prosthetics clinic. Drs. Abraham C. Kovarsky and Robert A. Stoller contribute significantly as consultants in Pediatric Orthopaedics. Dr. George V. B. Cochran remains active in the Research Laboratories investigating testing of cushion materials in prevention of decubitus. He is also involved in setting up energy consumption studies to evaluate relative efficiency of braces and other apparatus, and studies of electrical stimulation of bone healing.

Drs. Garrett and Boothe participated in the American Academy of Orthopaedic Surgeons course on Spinal Deformities in Children, with lectures on "Instability in Spinal Cord Injury." Dr. Garrett also participated as a faculty member of the American Academy of Orthopaedic Surgeons course on Reconstructive Surgery in Rheumatoid Arthritis. She moderated the "Knee Symposium" and gave an instructional course lecture on "Spinal Cord Injury" at the American Academy of Orthopaedic Surgery's annual meeting in Las Vegas. At the Annual Meeting of the American Academy of Cerebral Palsy, Dr. Garrett served as moderator, lecturing on "Hemiplegia" and "Diplegia."

Dr. Levine and Mrs. Nancy Keegan, Senior Pediatric Occupational Therapist, are engaged in a research program under the jurisdiction of the National Academy of Sciences investigating potential communication devices for athetoid cerebral palsied children. The Pediatric Orthopaedic Service developed a close affiliation with the Letchworth Village Complex and now provides consultation and surgery for the orthopaedic reconstructive problems encountered at that institution. The Orthopaedic Pediatric Service in addition developed affiliations on a consultation basis with the Rockland County Center for the Physically Handicapped and the Rise East program—a part of the Pomona Mental Health Complex.

Harlem Hospital Center

The Orthopaedic Section continued to utilize 55 adult and 55 pediatric beds, with a bed occupancy rate of over 90 per cent in 1973. There were approximately 2,000 outpatient clinic visits, a slight increase over last year.

Dr. Percival Caballaro joined the attending staff during the year, following a two-year fellowship.

The resident staff consists of seven members, who, with second-year residents from The New York Orthopaedic Hospital, provide adequate coverage.

Various clinical research projects were carried out by the staff during the year.

Roosevelt and St. Luke's Hospitals

The affiliation between Columbia University and Roosevelt and St. Luke's Hospitals continues to be mutually advantageous in both under- and post-graduate teaching opportunities. The benefits to all are many.

During 1973, 2,305 patients were admitted to The New York Orthopaedic Hospital and 2,704 opera-

tive procedures were carried out:

<i>Classification</i>	<i>Number of Procedures</i>
Back	186
Upper Extremity	928
Lower Extremity	655
Hip	631
Knee	287
Miscellaneous	17

There were 22,899 clinic visits and 2,784 patients returned to the follow-up clinic during the year.

Under Dr. Johnston's direction, routine diagnostic service was accorded 1,310 patients and 460 consultations were carried out in the Orthopaedic Pathology Laboratory.

1973 Publications

Orthopaedic Surgery

Bargren, J. H. and Bassett, C. A. L.

A single modulus of elasticity and its relation to electrical polarization in cortical bone subjected to cyclic tension and compression (Abstract). *J. Bone & Joint Surg.* 53-A:653, 1973.

Bassett, C. A. L.

A biophysical approach to craniofacial morphogenesis. *Acta. Morphol. Neerl.-Scandinav.* 10:71-86, 1972.

Carroll, R. E.

Reconstruction of a functioning unit in congenital absence of the hand. *J. Bone & Joint Surg.* 55-A:879, 1973.

Carroll, R. E. and Hill, N. A.

Arthrodesis of the carpometacarpal joint of the thumb. *J. Bone & Joint Surg.* 55-B:292-294, 1973.

Dick, H. M. and Louis, Dean S.

Ossifying lipofibroma of the median nerve. *J. Bone & Joint Surg.* 57-A, No. 5, 1973.

Eftekhari, Nas Ser

Status of femoral head replacement in treating fracture of femoral neck. Part I. *Orthoped. Rev.* 2, No. 6, June, 1973.

Status of femoral head replacement in treating fracture of femoral neck, Part II. *Orthoped. Rev.* Vol 2, No. 8, August, 1973.

Eftekhari, Nas Ser and Stinchfield, Frank E.

Total replacement of the hip joint by low friction arthroplasty. *Orthoped. Clin. North America* 4, No. 2, April, 1973.

Feldman, Frieda and Johnston, Austin D.

Intraosseous ganglion. *Am J. Roentgenol.* 118, No. 2, June, 1973.

Gjelsvik, Atle

Bone remodeling and piezoelectricity. I. *J. Biomech.* 6:69-77, 1973.

Bone remodeling and piezoelectricity. II. *J. Biomech.* 6:187-193, 1973.

Keim, H. A.

Trapshooting and your health. *Trap & Field* 149:112-113, 1973.

Low back Pain. *CIBA—Clinical Symposia*, 25th Anniversary Edition. 25:1-35, October, 1973.

Keim, H. A. and Greene, A. F.

Diastematomyelia and scoliosis. *J. Bone & Joint Surg.* 55-A, No. 6, October, 1973.

Kennedy, William R.; Johnston, Austin D. and

Becker, Alfred B.

Massive articular osteolysis in rheumatoid arthritis, treated by total hip replacement. *Clin. Orthoped.* 90, January-February, 1973.

Kuhn, Robert A. and Garrett, Alice

The halo in the management of cervical spine lesions. *Orthoped. Rev.* 1:6, 1972.

Leahey, Edward; Reyes, Rodolfo; Garrett, Alice and Chu, Luke S. W.

Clinical study of lower extremity amputees. *New York J. Med.* 73:10, 1973.

Nach, C. D. and Keim, H. A.

Prophylactic antibiotics in spinal surgery. *Orthoped. Rev.* 2, No. 6:27-30, June, 1973.

Neer, Charles S. II

Replacement arthroplasty for glenohumeral osteoarthritis. *J. Bone & Joint Surg.* 55-A, No. 8, December, 1973.

Neer, Charles S. II; Francis, Kenneth C.;

Johnston, Austin D. and Kiernan, Howard A., Jr.

Current concepts on the treatment of solitary unicameral bone cyst. *Clin. Orthoped.* 97:27-33, 1973.

Packer, John W.; Foster, Robert R.; Garcia, Alexander and Grantham, S. Ashby

The humeral fracture with radial nerve palsy: Is exploration warranted? *Clin. Orthoped.* 33:34-38, 1972.

- Rennie, William R. J. and Mitchell, Nelson
Flexion distraction fractures of the thoracolumbar spine. *J. Bone & Joint Surg.* 55-A:386, 1973.
- Rice, Robert W.; Cabot, Anthony and Johnston, Austin D.
The application of electron microscopy to the diagnostic differentiation of Ewing's sarcoma and reticulum cell sarcoma of bone. *Clin. Orthoped.* 95:174-185, 1973.
- Rothermel, Joel E.; Wessinger, James B. and Stinchfield, Frank E.
Dextran 40 and thromboembolism in total hip replacement surgery. *Arch. Surg.* 106:135-137, 1973.
- Stinchfield, Frank E.
Philosophy of experiences with total hip prosthesis—Guest editorial. *Orthoped. Rev.* 2, No. 2, February, 1973.
- Total hip replacement. In: *Current Practice in Orthopaedic Surgery*, Vol. 6. J. P. Ahstrom, Jr., ed. The C. V. Mosby Co., St. Louis, 1973, p. 134.
- The hip—Introduction. In: *Proc. of the 1st Open Scientific Meeting of the Hip Society*, 1973.
- Thornhill, Herbert L.; Richter, Ralph W.; Shelton, Marvin L. and Johnson, Christopher A.
Neuropathic arthropathy (Charcot forefeet) in chronic alcoholism. *Orthoped. Clin. North America* 4:7, 1973.
- Tornberg, David N.; Rice, Robert W. and Johnston, Austin D.
The ultrastructure of chondromyxoid fibroma; its biologic and diagnostic implications. *Clin. Orthoped.* September-October, 1973.
- Zengo, A. N.; Pawluk, R. J. and Bassett, C. A. L.
Stress-induced bioelectric potentials in the dentoalveolar complex. *Am. J. Orthod.* 64:17-27, 1973.

Otolaryngology

DANIEL C. BAKER, JR.

Professor and Chairman of the Department • Director of Service

The Department of Otolaryngology is pleased with the new Ear, Nose and Throat Clinic on the 10th floor of Vanderbilt Clinic, which has been occupied for the past year. The Clinic affords individual rooms for patients, as well as distinct advantages in clinical instruction of residents and medical students.

The Department has purchased a flexible fiberoptic bronchoscope which can be passed with ease without causing discomfort in most patients. The flexible tube allows for inspection of deeper levels of the tracheobronchial tree. It also permits biopsies to be taken under direct vision from smaller bronchial orifices.

Use of our conference area on the 11th floor of the Presbyterian Hospital has increased. Lectures and demonstrations with the use of audiovisual aids are carried out by the staff at conferences and for the instruction of medical students.

The new Audiology and Speech Clinic on the 10th floor of Vanderbilt Clinic is now in operation. All types of audiologic studies can be performed, and medical students have the opportunity to receive instruction in this field. Residents in Otolaryngology continue to receive special training.

The Department has a shortage of personnel to work in Vanderbilt Clinic and on the wards in Presbyterian Hospital. New staff members are being sought for positions in the College and Hospital. It will be helpful when additional space is available in the Atchley Pavilion.

The teaching of undergraduate students is an important Department function. Instruction in Ana-

tomy of the Head and Neck is given to first-year medical students. In the second year Physical Diagnosis of the Ear, Nose, and Throat is taught by means of lectures and demonstrations. The increasing numbers of medical students may require additional help in the form of instruction at our affiliated institutions.

Basic science courses were offered to graduate physicians serving residencies at Presbyterian, Roosevelt, and St. Luke's Hospitals. The courses were again given during the summer months. Dr. John Conley gave a graduate course in Surgical Anatomy of the Head and Neck.

Dr. Daniel C. Baker, Jr. was elected a senior counsellor of the American Board of Otolaryngology. He served on the Graduate Education Committee of the American College of Surgeons.

Dr. Milos Basek has been studying the use of ultrasound in the treatment of Menière's disease. He is cooperating with the Neurological Surgery Service on the translabyrinthine approach to acoustic nerve tumors.

Dr. John Conley continued his active career in the field of head and neck surgery and plastic and reconstructive surgery of these structures. He was elected President of the American Academy of Ophthalmology and Otolaryngology. He is a member of the Council of the National Head and Neck Cancer Cadre of the National Cancer Institute. He served on three symposia at the X World Congress of Otolaryngology in Venice, Italy and was a guest speaker at the meeting of the German Society of

Otolaryngology in June 1973. He continues as a member of the Board of Governors of the American College of Surgeons. He was made an honorary member of the Italian Society of Otolaryngology. He has had distinguished visitors from Germany, England, South Africa, and Australia. He was a guest speaker at the South African Society of Otorhinolaryngology meetings in South Africa and Kenya and spent one month giving lectures and operative demonstrations to members of that society. Dr. Conley has also continued research on reconstructive surgery of the larynx, flaps in laryngeal surgery, mandibular restoration, techniques for rhinotomy and blepharoplasty, and the facial nerve in the presence of tumors.

Dr. Thomas H. Fay, Professor of Clinical Audiology and Speech Pathology, serves on the Noise Control Advisory Board of the City of New York. He is also Chairman of the Committee on Noise Abatement. He is a special advisor on communications to the New York City Fire and Police Departments.

Dr. Robin Rankow was elected President of the Society of Maxillofacial Surgeons. He prepared a motion picture film, "Superficial Parotidectomy with Preservation of the Facial Nerve." He served as Visiting Professor at the University of Barcelona School of Medicine in Spain from June 2-5, 1973, and was an active participant in the Congress of the German Society of Plastic and Maxillofacial Surgeons in Basel, Switzerland, June 6-8, 1973.

Drs. Conley, Basek, and Lawrence Savetsky attended the X International Congress of Otolaryngology in Venice, Italy, May 21-26, 1973.

Dr. Robert M. Hui served as Chairman of the Section on Otolaryngology of the New York Academy of Medicine and was Secretary of the Otolaryngology Section of the New York State Medical Society. He has been working with Dr. Edgar M. Housepian (Neurological Surgery) on newer approaches to surgery of the pituitary gland. Dr. Hui has also been working on the surgical approach in the management of the malignant exophthalmos of Grave's disease.

Dr. Jules G. Waltner gave a graduate course on Techniques of Tympanoplasty and Repair of Congenital Atresia of the Ear at the University of Florence, Italy in September 1973. He continued research on the histopathological physiology of the temporal bone.

Dr. Juergen Tonndorf with Dr. Shyam Khanna gave papers at the Hals-, Nasen-, Ohren Congress in Berlin, Germany in June 1973, as well as at Keele and Warwick Universities, in England. Dr. Tonndorf was made an honorary member of the German Otological Society in June 1973.

The Department has received financial support from the Montargent Foundation, the Allen Foundation, The American Otological Society, the Deafness Research Foundation, and the National Institute of Neurological Diseases and Stroke.

In the Department of Otolaryngology there were 1,853 admissions to the Presbyterian Hospital, 529 admissions to the Babies Hospital, 15,883 visits to the Vanderbilt Clinic, 495 consultations, 1,171 operations in Presbyterian Hospital and 545 operations in the Babies Hospital.

1973 Publications

Otolaryngology

Basek, Milos

Ultrasound for Menière's disease. *Arch. Otol.* 97:133-134, 1973.

Chang, C. H.; Conley, J. J. and Ju, Herbert C.

Radiotherapy of advanced carcinoma of the oropharyngeal region under hyperbaric oxygenation: An interim report. *Am. J. Roentgenol.* 117:509-516, 1973.

Conley, J.; Cinelli, P. B.; Johnson, P. M. et al.

Investigation of bone changes in composite flaps after transfer to head and neck region. *Plast. & Reconstr. Surg.* 51:658-661, 1973.

Conley, John and Janecka, Ivo

Neurilemmoma of the facial nerve. *Plast. & Reconstr. Surg.* 52:55-60, 1973.

Conley, John and Sadoyama, J. A.

Squamous cell cancer of the buccal mucosa. *Arch. Otol.* 97:330-333, 1973.

Rankow, Robin

Surgical decisions in the treatment of major salivary gland tumors. *Plast. & Reconstr. Surg.* 51:514-523, 1973.

Pathology

DONALD W. KING

Delafield Professor and Chairman of the Department • Director of Service

Teaching

The Annual Meeting of the Department was held at Arden house September 28-30 and was devoted to the Economic Aspects of Health Care. Guest speakers included Drs. Victor Fuchs (Mt. Sinai School of Medicine), Eli Ginzberg (Columbia), Herbert Klarman (New York University), Calvin Plimpton (S.U.N.Y.), and Hans Popper (Mt. Sinai) and Senator Charles Goodell.

The History of Pathology series continued with lectures on "Viennese Pathology before World War II" by Dr. Hans Popper; "Distinguished Careers Ruined by an Incident," by Dr. Lester Cahn; "Of Paget and Parasites, Pigs and Politics," by Dr. Fred Silva; "Food Habits and Nutrition," by Dr. Hans Kaunitz; "Pandora's Box," by Dr. Angus Sampath; and "Sir Frederick Treves, Surgeon, Teacher and Pathologist," by Dr. B. E. D. Cooke from the University of Wales.

Students from the Medical Scientist M.D.-Ph.D. program in 12 medical schools held a seminar on immunogenetics in Aspen, Colorado.

Dr. Raymond Gambino continued as Course Director for the medical school course in Pathology. He was assisted in this task by co-directors Drs. Whitley Branwood, Lester Geller, Mary E. King, and Robert Pascal.

A new course in pathology was introduced at Columbia's 116th Street Campus for graduate students and undergraduates majoring in biology, conducted by Drs. Gabriel Godman, Henry Vogel, and

Donald and Mary Elizabeth King. It covered cell injury, immunopathology, neoplasia, and genetic disease.

The acquisition this summer of the Shibaden T.V. camera, Zeiss Microscope, Ampex Video Recorder, and two Sony TV monitors will add a new dimension to teaching conferences. It is expected that this equipment will be fully operational by the end of October.

With Ms. Florence Rollwagen, M.S., Dr. Pascal firmly established the Central Tissue Facility of the Columbia Cancer Research Center in January 1973, and since then neoplastic and other tissues were collected, prepared, and made available for various research techniques used by other investigators in the Center. During the year, the Central Renal Pathology Laboratory was organized under Dr. Conrad I. Pirani. The Clinical Chemistry Division moved into new quarters in BHA-4 in August 1973.

New Appointments

Newly appointed were Dr. Sidney Pestka, Adjunct Professor of Pathology; Drs. John Kiyasu and Louise Phillips, Associate Clinical Professors; Basil Moumgis, Adjunct Associate Professor; Arthur Hurvitz and Catherine Kambolis, Adjunct Assistant Professors; Nicole Suciu-Foca, Assistant Professor of Experimental Pathology (in Surgery); Milagros Ona-Sarino, Robert Kranich, Gifford Lum, Joel Roth, Instructors; Elizabeth Jacobs, Kokila Mody, Elo Urm, Charles Plank, Thomas Mao, Mary Parshley, Research Associates; and Elena Schmidt, Research

Fellow. Dr. George Wilner, after a two-year military leave of absence, rejoined the Department.

Promotions

Dr. Harry Ioachim became Adjunct Professor; Drs. Ruth Vogel and Arline Deitch, Associate Professors of Experimental Pathology; Drs. Ernest Baden, Harry Stumpf, Frederick Zugibe, Adjunct Associate Professors; Dr. Mathieu Seide, Assistant Clinical Professor; and Drs. Paul Bachner and Glenna Corley, Adjunct Assistant Professors.

Retirement

Dr. Sigmund Wilens, Professor of Pathology, retired.

Resignations

Drs. Richard Sabbia, Robert Wenk, John Scott resigned. Dr. Alex Ferenczy left the Division of Obstetrics and Gynecology to assume directorship of the Division of Obstetrics and Gynecology Pathology at the Jewish Hospital in Montreal, Canada.

Honors

Dr. Ernest Baden was invited as guest professor in the Department of Anatomic Pathology, Faculty of Medicine, Stellenbosch, Tiervlei, South Africa. Dr. Thomas Blumenfeld was appointed Pediatric and Microchemistry Consultant to New York Zoological Society—Bronx Zoo, Bronx, N. Y. In July Dr. Gordon Kaye received a Research Career Development Award from the National Institute of Arthritis, Metabolic and Digestive Diseases. Dr. Nathan Lane was an invited speaker at the American Cancer Society meeting for the Second International Conference on Cancer of the Colon and Rectum and became a member of the Pathology Sub-Committee of the National Large Bowel Cancer Project.

Dr. Raffaele Lattes attended the International Congress on Multiple Primary Malignant Tumours in Perugia, Italy and on October 19-25 conducted the annual seminar of the American Society of Clinical Pathologists on soft tissue tumors with Dr. Franz Enzinger of the Armed Forces Institute of Pathology in Chicago, Illinois.

Dr. Pirani was invited to give a lecture in Brescia, Italy on "Classification of Glomerular Diseases" and in May 1973, delivered the Jean R. Oliver Lecture on "Renal Involvement in SLE" at the Downstate Medical Center, S.U.N.Y. Dr. Pirani is a member of Pathology Study Group A, N.I.H.; the Editorial Board of *Laboratory Investigation*; and the Medical Advisory Board of the Kidney Foundation of New York. Dr. George Wilner is the recipient of a Ca-

reer Development Award from the National Heart and Lung Institute. Dr. Jacob Furth was elected to honorary membership in the American Association for Cancer Research, 1972, received the Alessandro Pascoli Prize at the Fifth Perugia International Conference on Cancer (Perugia, Italy), and was appointed to the Breast Cancer Experimental Biology Committee of the National Cancer Institute.

Research

Division of General Pathology

Dr. Gabriel C. Godman and Mr. Stanley Sawicki continued to investigate cellular susceptibility and resistance to carcinostatic agents, especially actinomycin D. The actions of the interesting and imperfectly understood cyto-chalasin (which paralyze cells and interfere with several functions including cell division) were explored with Mr. Armand Miranda, Dr. Arline D. Deitch, Miss J. Tannenbaum (graduate student, Microbiology). The effect of cyto-chalasin on the infectivity of several classes of viruses was explored with Dr. Gabriel Godman and Mr. Stanley Sawicki. Poliovirus and parainfluenza virus infections of cells in culture were found to be facilitated if the host cells were treated with cyto-chalasin B or D.

Dr. Ruth H. and Henry Vogel and Miss Mary C. Moran studied aspects of the mammalian cell surface in cultures of diploid rat aorta fibroblasts, including membrane properties explored with plant lectins and serum factors and uptake phenomena investigated with labeled amino acids.

With Drs. Ruth H. Vogel, William L. McLellan, George J. Knight, Curtis J. Suerth, Elo Urm, Arthur P. Bollon, and Miss Evelyn A. Devine, Dr. Henry J. Vogel continued research on enzyme repression in the arginine biosynthetic system of *Escherichia coli*, with emphasis on the translational and transcriptional components of the repression process.

Drs. John Fenoglio, Bernard Wagner, and Andrew Wit (Pharmacology) suggested the possibility of left atrial arrhythmias (in dogs) arising from the cardiac muscle in the mitral valve leaflets. Drs. Fenoglio, Wit, and Peter Friedman (Pharmacology) are studying the role of subendocardial Purkinje fibers which survive experimental infarcts in dogs in the genesis of postinfarction ventricular arrhythmias.

Dr. David Zegarelli reported studies on dentition of rats given antileukemia drugs. Dr. Hans Kaunitz observed that young female rats fed soy protein (commercially prepared for human consumption) had severe renal lesions.

Dr. Victor Herbert reported inhibition by diphenylhydantoin of folic acid absorption in man (which

may explain the frequency of folic acid deficiency in patients taking this anticonvulsant). He also showed that the vitamin B₁₂-binding protein of granulocytes may be a major source of the third vitamin B₁₂-binding protein of serum (thus providing a simple new way to measure granulocyte pools in man). He demonstrated selective suppression of lymphocyte subpopulations by varying concentrations of immunosuppressive drugs (an observation which may prove important in preventing graft-versus-host reactions and in treating lymphoproliferative disorders).

Drs. Donald and Mary Elizabeth King continued study of a compound on the membrane of cancer cells (cytolipin H) reported to react with blood from patients with cancer. To increase the sensitivity of the reaction, they determined, with Dr. Rapport (Biochemistry), the conditions for increased uptake of cytolipin H by cells.

Dr. Philip Duffy, Director of the Division of Neuropathology, continued studies of the effects of tumor-conditioned media upon growth of cells in tissue culture with Dr. Arthur Hays, who is making labelled putrescine determinations on the same cells to clarify the role of polyamines in these growth changes. Drs. Duffy, Stanek, and Hilla (Radiology) are performing joint studies on the vasculature of brain tumors. Ultrastructural features of influenza virus replication in experimental encephalitis were reported by Drs. Duffy, Wolf, Harter (Neurology), Gamboa (Neurology), and Hsu (Microbiology); light microscopic and fluorescence microscopic pathologic findings were reported by Drs. Miyoshi, Wolf, Harter, Gamboa, and Duffy. A fluorescence microscopic demonstration of Influenza A virus as a possible cause of postencephalitic Parkinsonism was reported by Drs. Gamboa, Wolf, Yahr (Neurology), Barden, Hsu, Duffy, and Harter. The ultrastructural, anatomic pathologic, and nosologic features of Hallervorden Spatz disease and neuroaxonal dystrophy were documented by Drs. Defendini, Markesbery, Mastri, and Duffy.

Drs. David Cowen and Lester Geller continued long-term studies of the etiology and consequences of perinatal brain damage. With Drs. Kaunitz and Abner Wolf, Miss Ruth Johnson, and Mrs. Mildred Shemesh, they examined in rats the short- and long-term effects of protein-calorie deficiency experienced from birth throughout life on growth, behavior, and the structure of the central nervous system and certain other organs.

Drs. L. Roizin and N. Willson and H. C. Liu, M.S., with Dr. J. Schneider and C. Mullen, M.S. (New York State Research Institute for Mental Retarda-

tion, Staten Island, N. Y.), in investigations on the prolonged effects of LSD-25 administration upon neurons of rod ganglia tissue cultures, observed electron microscope qualitative and quantitative changes of intraneuronal organelles, particularly their unit membranes.

Dr. Virginia Tennyson studied development of the neostriatum in the rabbit, using fluorescence and electron microscopy. She also studied acetylcholinesterase (AChE) activity in developing rabbit muscle and showed that AChE activity is in the reticulum within the myotubes, as well as in mononuclear cells lining the myotubes during early stages of development. Fluorescence and electron microscopic investigations on the development of embryonic sympathetic ganglia are still in progress.

Dr. Liselotte Graf continued studies of detection, isolation, identification, and distribution of glycosphingolipid haptens. Sections of all human tumors showed intense staining of cell membranes and of some stromal elements; the antisera used were prepared against human tumors or against a lactose-protein conjugate. Upon absorption of these sera with cytolipin H (lactosyl ceramide) fluorescence was greatly diminished.

Dr. Herbert Barden reported that in postencephalitic parkinsonism (a neurological sequel in most individuals who at some time during 1919-1926 survived von Economo's disease, or encephalitis lethargica), antigenic sites characteristic of influenza A were shown by histochemical means to be localized to the nuclei of brain neurons. Such antigenic sites were not demonstrable in idiopathic and non-Parkinson's disease brains.

Division of Surgical Pathology

Dr. Kaye, with Drs. Frank Hoefle and Anthony Donn (Ophthalmology) continued studies on the nature, function, and variability of the corneal endothelial barrier in the maintenance of normal corneal hydration. With Dr. Jorge Fischbarg, Drs. Kaye, Fenoglio, and Hoefle studied the effects of cytochalasin-B on the structure and function of the corneal endothelium. With Dr. Jules Baum and Ms. Marcia Perlman of Tufts University-New England Medical Center, Dr. Kaye has been studying the structure and collagen synthetic activity of monolayer cultures of corneal endothelium.

Dr. Virginia LiVolsi, with Drs. Carl Feind (Surgery) and Paul LoGerfo (Surgery) and Dr. Armen Tashjian (Pharmacology, Harvard), studied thyroid C-cells in numerous thyroid diseases, hyperparathyroidism, and hypercalcemia associated with neoplastic diseases. Recently this group has begun in-

investigating the physiological and pathophysiological relationships among the hormones calcitonin, parathyroid hormone, and gastrin, trying to elucidate the meaning of the finding of increased association of peptic ulcer disease in hyperparathyroidism, and a recent finding of hypercalcitoninemia in 75 per cent of patients with the Zollinger-Ellison syndrome. Dr. Marianne Wolff is working on a study of epithelial neoplasms of the vermiform appendix and continues to study lymphangiomyomatosis, scar-associated carcinomas, and foreign-body granulomas of the nasal mucosa. Dr. Karl H. Perzin completed a study on endometriosis of small intestine. He continued work on nonepithelial tumors of the nasal cavity, paranasal sinuses, and nasopharynx and a study on carcinoma arising in median ectopic thyroid.

Division of Pediatric Pathology

Dr. William A. Blanc, with Dr. Richard L. Naeye (Hershey Medical School) studied the effects of environmental factors on the human fetus. Their work concerned the effects of poverty and maternal nutrition on perinatal infection and mortality and demonstrated a close relationship between poverty, small infant size, higher mortality, and higher death rate from infection.

Drs. H. J. Wigger and G. Mellin (Pediatrics) continued work on a computer-based system for storage and retrieval of diagnoses from autopsy and surgical material using natural language. Dr. Wigger collaborated with Drs. Bray, Hsu, and Leroy on characterization of isolated human trophoblast basement membrane material. With Drs. Ruth Harris (Pediatrics) and J. B. Price (Surgery) he is studying the hepatic morphology in newborn lambs with cholestatic jaundice following hepatic artery ligation and bilirubin loading.

Division of Obstetric and Gynecologic Pathology

Drs. Ferenczy and Ralph Richart continued studies of the female genital tract using transmission and scanning electron microscopy and prepared an atlas to be published early in 1974. Drs. Hsu, Ferenczy, and Richart continued studies of the copper-T intrauterine contraceptive device using the electron probe analyzer and found that copper is present principally in uterine fluids. In the endometrial cells, copper is not detectable using this technique, suggesting very low intracellular levels.

Division of Clinical Pathology

Drs. Galen and Gambino studied LDH and CPK isoenzymes in various states. In blood collected from the coronary sinus, it is possible to estimate the degree of myocardial injury during cardiac surgery.

Drs. Lum and Gambino studied four methods for measuring uric acid and found that a kinetic uricase method gave the highest precision and accuracy.

Drs. John G. Gorman and Vincent J. Freda (Obstetrics and Gynecology) are continuing follow-up of mothers in the Columbia RhoGAM Clinical Trial through subsequent pregnancies; 182 of these mothers subsequently delivered RH-positive babies. None of the 149 RhoGAM-treated mothers was sensitized at subsequent delivery whereas four of 33 control mothers were immunized and their babies affected.

Division of Uropathology

Experiments are in progress to isolate and purify specific antigens associated with prostatic, renal, and other genitourinary cancers. Tests on frozen sections of tumor using fluorescein-labeled antibodies to carcinoembryonic antigens (CEA), tumor-associated antigen (TAA), human immunoglobulins, and complement and on the three-layer immunoperoxidase technique adapted by Dr. Konrad Hsu (Microbiology) were conducted.

Dr. Philip Tomashefsky investigated the immunogenic potential of the Furth-Columbia rat Wilms tumor. Using standard techniques he combined free tumor cells, extracts, homogenates, or combinations of these, with suitable adjuvants such as Freund's or BCG to inactivate the tumor and injected it into various sites in rats and then challenged them with active tumor cells.

Delafield Hospital

Drs. Joshua Fierer and J. Klavin are identifying and isolating tumor-associated antigens in fetal and neoplastic tissues. With Dr. S. Werner (Medicine) Dr. Fierer is studying immunopathologic aspects of Grave's disease. With Drs. G. Turino (Medicine), I. Mandl (Obstetrics and Gynecology), L. Greenbaum (Pharmacology), and M. Parshley, Dr. Fierer is applying immunofluorescent and electron microscopic techniques in a study of connective tissue changes in obstructive lung disease.

Dr. Robert Pascal, with Dr. Cecilia Fenoglio, completed a retrospective study of the frequency of precancerous and malignant lesions in ulcerative colitis. With Dr. Robert L. Kassel (Sloan-Kettering Institute) and Dr. M. Koss, Dr. Pascal is carrying out electron microscopic and immunohistologic studies of glomerulonephritic lesions in spontaneous murine leukemia, and in human tissue at autopsy attempts are being made to isolate and identify the responsible antigens for this kidney lesion. Dr. Branwood continued study of the myocardium and cardiovascular system. An experimental model has been

devised in which myocardium is grown *in vitro* for seven days and ultrastructural changes studied.

Dr. Jacob Furth, with guest research associate Dr. G. Ueda, and collaborating colleagues (J. M. Hershman, Wadsworth V. A. Hospital, Los Angeles, Calif., J. M. Martin, Hospital for Sick Children, Toronto, Canada, and D. S. Schalch, University of Rochester, Rochester, N. Y.) extended earlier work on the character of multihormonal activities of diverse neoplastic pituitary cells. All multihormonal tumors investigated followed homeostatic derangement of a single pituitary cell type.

Harlem Hospital

Drs. Prem Chauhan and Carlos Navarro are studying the pathology of saline-induced abortions; Drs. Theophilus Roberts and Chauhan, liver abnormalities in heroin addicts; Drs. Roberts and Wu, *in vitro* Kveim tests; and Drs. Hagstrom and Veith (Einstein), experimental and human lung transplantation. Dr. Clayton Natta in addition to work described elsewhere conducted mass screening by hemoglobin electrophoresis for sickle cell disease and other hemoglobinopathies. The purpose is to find the incidence of sickling and other hemoglobinopathies. At the same time, the study is expected to improve patient care. This work is being done in collaboration with the Comprehensive Sickle Cell Center.

Lenox Hill Hospital

Dr. Harry Ioachim found that newborn rats are highly susceptible to viral induction of lymphoma but become naturally resistant after two weeks. Protection during this period can be conferred by transfer of material immunity, which occurs before and after birth. In another study, Drs. Ioachim and B. H. Dorsett found that heterologous antisera produced against pools of ovarian carcinoma tissues react consistently and specifically with the tissues of origin in immunodiffusion and immunofluorescence tests.

Roosevelt Hospital

Dr. Bozidar Lazarevic is engaged in research on autoradiographic explanation of excretion of ^{99m}Tc

and Iodine-131 by gastric mucosal cells with Drs. H. Clay Alexander (Surgery) and David Marsden (Radiology).

Dr. John Kiyasu, screening carbohydrate sensitivities in normal subjects, demonstrated drastic transient shifts in their lipoprotein patterns, suggesting that the cause of this response was the carbohydrate load.

Dr. Louise Phillips is pursuing coagulation studies on patients undergoing second-trimester abortions induced by intraamniotic or extraovular prostaglandin $\text{F}_{2\alpha}$; these patients tend to have significant increases in platelets, fibrinogen, and factors V and VIII, as compared with patients whose abortions are induced by hypertonic saline, who have decreases in the same factors.

Acknowledgments

Sources of research support include: National Institute of Arthritis and Metabolic Diseases, American Cancer Society, The National Association for Retarded Children, the Mattheson Foundation, the Muscular Dystrophy Association, the Clinical Center for Parkinson and Allied Diseases (U.S.P.H.S.-supported), the National Institute of Neurological Diseases and Stroke, Foundation for Ileitis and Colitis, Inc., National Institute of Child Health and Human Development, National Cancer Institute, Institute of General Medical Sciences, National Institute of Allergy and Infectious Diseases, Damon Runyon Memorial Fund for Cancer Research, Lasdon Foundation, Stony Wold Foundation, Ortho Research Foundation, National Association for Tuberculosis and Respiratory Diseases, Merck Foundation, Health Research Council of the City of New York, Mildred Werner League, Mr. and Mrs. Jacques Weber, Mrs. Rufus Poole, Mr. Richard Barnes, Mrs. Ruby Schinasi, Mr. Paul C. Blum, and Mr. Norman C. Norman.

At Harlem Hospital, urinary catheter studies are being funded by a grant from the G.D. Searle Co., Dr. Robert McCabe, and the F. Higginson Cabot family.

1973 Publications

Pathology

- Azar, Henry A.; Moscovic, Edward A.; AbuNassar, Solange G. and McDougal, J. Steven
Some aspects of sarcoidosis. In: *Current Topics in Pathology*, 57, 1973.
- Azar, H. A.; Zaino, E. C.; Pham, T. D. and Yannopoulos, K.
"Nonsecretory" plasma cell myeloma: Observations on seven cases with electron microscopic studies. *Am. J. Clin. Path.* 58:618-629, 1972.
- Baden, E.
Book review of *Histological Typing of Oral and Oropharyngeal Tumors: International Histological Classification of Tumors, No. 4*, by B. Cohen, U. K. Luthra and H. Torloni. World Health Organization, Geneva. 1971). *New England J. Med.* 286:438-439, 1972.
- Bank, A.; Dow, L. W.; O'Donnel, J. V.; Ford, S. and Natta, C.
Changes in globin synthesis with erythroid cell maturation in sickle-thalassemia. *Blood* 41:353-357, 1973.
- Barden, Herbert and Barrett, Robert
The localization of catecholamine fluorescence to dog hypothalamic neuromelanin-bearing neurons. *J. Histochem.* 21:175-183, 1973.
- Berk, R. S.; Baden, E.; Ladov, M. and Williams, A. C.
Adenoameloblastoma (odontogenic adenomatoid tumor): Report of case. *J. Oral Surg.* 30:201-208, 1972.
- Berkman, J. I.; Klavins, J. V.; Weiss, M.; Mesa-Tejada, R. and Fierer, J. A.
Demonstration of universal fetal components in sera and tissues of patients with malignant neoplasms. *Fed. Proc.* 32:834, 1973.
- Bernstein, L. and Herbert, V.
The role of pancreatic exocrine secretions in the absorption of vitamin B₁₂ and iron. *Am. J. Clin. Nutrition* 26:340-346, 1973.
- Biedler, June; Helson, L. and Suciu-Foca, Nicole
Expression of HL-A antigens on neuroblastoma cells in continuous culture. *In Vitro* 8:410, 1973.
- Bollon, A. P. and Vogel, H. J.
Regulation of *argE-argH* expression with arginine derivatives in *Escherichia coli*: Extreme non-uniformity of repression and conditional repressive action, *J. Bact.* 114:632-640, 1973.
- Bransilver, B. R.; Ferenczy, A. and Richart, R. M.
Female genital tract remnants. An ultrastructural comparison of hydatid of Morgagni and mesonephric ducts and tubules. *Arch. Path.* 96:255-262, 1973.
- Brownstein, Martin H.; Fernando, Soledad and Shapiro, Lewis
Clear cell acanthoma: Clinicopathologic analysis of 37 new cases. *Am. J. Clin. Path.* 59:3, 1973.
- Buda, Joseph; Jacob, Ginette; Lattes, Conrad; Reemtsma, Keith; Stevens, Lawrence and Suciu-Foca, N.
The clinical value of blast cell count (BCC) for prediction of allograft rejection. *Clin. Res.* 31:836, 1973.
- Buda, J.; Suciu-Foca, N. and Reemtsma, K.
Inhibition of lymphocyte blastogenesis by Sera from cancer patients. *Excerpta Med. (Internat. Congr. Series)* 275:79, 1973.
- Button, Kenneth F. and Gambino, S. Raymond
Laboratory diagnosis by computer. *Computers Biol. Med.* 3:131-136, 1973.
- Campbell, J. J.; Baden, E. and Williams, A. C.
Nasopalatine cyst of unusual size: Report of case. *J. Oral Surg.* 31:776-779, 1973.
- Campbell, W. L.; Santiago, H. E.; Perzin, K. H. and Johnson, P. M.
The autonomous thyroid nodule: Correlation of scan appearance and histopathology. *Radiology* 107:133-138, 1973.
- Campbell, William L. and Wolff, M.
Retrorectal cysts of developmental origin. *Am. J. Roentgenol.* 117:307-313, 1973.
- Cardasis, Constance A.; Blanc, William A. and Sincliar, John C.
The effects of ambient temperature on the fasted newborn rabbit. II. Gross and microscopic changes in cervical and interscapular brown adipose tissue. *Biol. Neonate* 21:347, 1972.
- Christy, N. P.; Weiss, H. J.; Phillips, L. L.; Phillips, G. B. and Hopewell, W.
Exotic snakebite in an urban setting: Heparin therapy of disseminated intravascular coagulation in a patient bitten by a saw-scaled Viper (*Echis carinatus*). *Trans. Am. Clin. & Climat. A.* 84:37, 1973.
- Defendini, R.; Markesbery, Wm.; Mastro, A. and Duffy, P. E.
Hallervorden-Spatz disease and infantile neuroaxonal dystrophy. Ultrastructure, anatomical pathology and nosology. *J. Neurol. Sci.* 20:7-23, 1973.
- Deitch, A. D.; Godman, G. C. and Tanenbaum, Stuart W.
Cytochalasin D enhances infectivity of poliovirus. *Proc. Soc. Exper. Biol. & Med.* 114:60-64, 1973.
- Deitch, Arline D., Miranda, A. F. and Godman, G. C.
Culture dish for high resolution microscopy. Chapter 6 In: *Methods and Applications of Tissue Culture*. P. F. Kruse, and M. K. Patterson, eds. Academic Press, New York, 1973.
- Dillard, M. G.; Dujoen, Isabel; Pollak, V. E. and Pirani, C. L.
The effect of treatment with prednisone and nitrogen mustard on the renal lesions and life span of patients with lupus glomerulonephritis. *Nephron* 10:273-291, 1973.
- Dow, L. W.; Terada, M.; Natta, C.; Metafora, S.; Grossbard, E.; Marks, P. A. and Bank, A.
A comparison of globin synthesis directed by intact cells and isolated mRNA in β thalassemia. *Nature* 243:114-116, 1973.
- Duffy, P. E.; Wolf, A.; Harter, D.; Bamboa, E. and Hsu, K.
Murine influenza virus encephalomyelitis. Electron microscopic observation. *J. Neuropath. & Exper. Neurol.* 32:72-91, 1973.

Fenoglio, C. M.; Ferenczy, A.; Isobe, T. and Osserman, E.

Hepatoma associated with marked plasmacytosis and polyclonal hypergammaglobulinemia. *Am. J. Med.* 55:111-115, 1973.

Fenoglio, C. M.; Kaye, G. I. and Lane, N.

The distribution of human colonic lymphatics in normal hyperplastic and adenomatous tissue. Its probable relationship to metastasis from small carcinomas in pedunculated adenomas, with two case reports. *Gastroenterology* 64:61-66, 1973.

Fenoglio, C. M. and Pascal, R. R.

Adenomatous epithelium, intraepithelial anaplasia, and invasive carcinoma in ulcerative colitis. *Am. J. Digest. Dis.* 18:556-562, 1973.

Fenoglio, J. J. and Wagner, B. M.

Studies in rheumatic fever. VI. Ultrastructure of chronic rheumatic heart disease. *Am. J. Path.* 72:623-640, 1973.

Ferenczy, A. and Richart, R. M.

Scanning electron microscopy of the hyperplastic and neoplastic endometria. In: *Scanning Electron Microscopy, 1973. Part III: Proceedings of the Workshop on Scanning Electron Microscopy in Pathology*. O. Johari, ed. IIT Research Institute, Chicago, 1973, pp. 613-620. Scanning electron microscopic study of normal and molar trophoblast. *J. Gynec. Oncol.* 1:95-110, 1972.

Scanning electron microscopy of the cervical transformation zone. *Amer. J. Obst. & Gynec.* 115:151-157, 1973.

Scanning and transmission electron microscopy of the human endometrial surface epithelium. *J. Clin. Endocrinol.* 36:999-1008, 1973.

Fierer, J. A.; Klavins, J. V.; Weiss, M.; Mesa-Tejada, R.; Berkman, J. I. and Rollwagen, F.

Oncofetal antigens extracted from human embryonic tissues. *Am. J. Path.* 70:11a, 1973.

Finkel, P. N.; Kronenberg, K.; Pesce, A. J.; Pollak, V. E. and Pirani, C. L.

Adult Fanconi syndrome, amyloidosis and marked X-light chain proteinuria. *Nephron* 10:1-24, 1973.

Frick, H. C. II; Munnell, E. W.; Richart, R. M.;

Berger, A. P. and Lawry, M. F.

Carcinoma of the endometrium. *Am. J. Obst. & Gynec.* 115:663-672, 1973.

Friedman, P. L.; Stewart, J. R.; Fenoglio, J. J. and Wit, A. L.

Survival of subendocardial Purkinje fibers after extensive myocardial infarction in dogs; *In vivo* and *in vitro* correlations. *Circulation Res.* 33:553-569, 1973.

Fuhr, J. E. and Natta, C.

Translational control of alpha and beta globin synthesis. *Nature* 240:274, 1972.

Furth, Jacob; Martin, Julio M.; Moy, Peggy and Ueda, Gaiko

Growth hormonal activity of thyrotropic pituitary tumors. *Proc. Soc. Exper. Biol. & Med.* 142:511-515, 1973.

Furth, Jacob; Moy, Peggy, Hershman, Jerome M. and Ueda, Gaiko

Thyrotropic tumor syndrome: A multiglandular disease induced by sustained deficiency of thyroid hormones. *Arch. Path.* 96:217-226, 1973.

Furth, Jacob; Moy, Peggy; Schalch, Don S. and Ueda, Gaiko

Gonadotropic activities of thyrotropic tumors; demonstration by immunohistochemical staining. *Proc. Soc. Exper. Biol. & Med.* 142:1180-1184, 1973.

Gambino, S. Raymond

Education and management. *Pathologist*, November, 1972, pp. 315-317.

Gambino, S. Raymond and Sher, Paul P.

Measurement of blood acid-base and oxygen. In: *The Body Fluids in Pediatrics*. Robert W. Winters, ed. Little, Brown & Co., Boston, 1973.

Gardstein, H. F.; Ferenczy, A. and Richart, R. M.

Asymptomatic bilateral ovarian infarction and venous thrombosis. *Am. J. Obst. & Gynec.* 116:1164-1166, 1973.

Garrett, R. and Ames, R. P.

Black pigmented adenoma of the adrenal gland. *Arch. Path.* 95:349-353, 1973.

Geller, Lester M.

Audiogenic seizure susceptibility in rats X-irradiated *in utero* late in pregnancy. *Exper. Neurol.* 38:135-143, 1973.

Godman, G. C.; Keneklis, T. P. and King, M. E.

Mitochondria and respiratory enzymes of L cells treated with actinomycin D. *Exper. Cell Res.* 77:159-166, 1973.

Goodman, Reba M. and Benjamin, W. B.

Nucleoprotein methylation in salivary gland chromosomes of *Sciara Coprophila*: Correlation with DNA synthesis. *Exper. Cell Res.* 77:63-72, 1973.

Gorman, John G.

Symposium: Rh immune globulin. *Contemporary Ob/Gyn.* 1:3, March, 1973.

Herbert, V.

Folic acid and vitamin B₁₂. In: *Modern Nutrition in Health and Disease*, 5th ed. R. S. Goodhart and M. E. Shils, eds., pp. 221-244.

Folate metabolism; folate deficiency in developing populations: In: *Lectures, XIV International Congress of Hematology, Sao Paulo, Brazil, July 16-21, 1972*.

Secretariat of Culture, Sports and Tourism, Government of the State of Sao Paulo, p. 6.

The five possible causes of all nutrient deficiency: Illustrated by deficiencies of vitamin B₁₂ and folic acid. *Am. J. Clin. Nutrition* 26:77-88, 1973.

Herbert, V.; Bloomfield, J.; Stebbins, R. and Scott, J.

Use of fluoride to prevent erroneously high measurements of human serum unsaturated B₁₂ binding capacity (UBBC); evidence that granulocyte-derived binders (Transcobalamin I and III) (TCI and III) are a smaller component of normal circulating UBBC than previously believed. *J. Clin. Invest.* 52:39a, 1973.

- Herbert, V.; Spivack, M.; Ocasio, E.; Kimmel, K; Ghanta, V.; Brenner, L.; Freundlich, J. and Scott, J. Folate deficiency in a municipal prenatal clinic. *Clin. Res.* 21:538, 1973.
- Herbert, V. and Tisman, G.
Effects of deficiencies of folic acid with vitamin B₁₂ on central nervous system function and development. In: *Biology of Brain Dysfunction*, Vol. 1. Ed. G. Gaull, Plenum Press, New York and London, 1973, pp. 373-392.
- Herbert V.; Tisman, G.; Go. L. T. and Brenner, L.
The dU suppression test using I¹²⁵-Udr to define biochemical megaloblastosis. *Brit. J. Haemat.* 24:771-721, 1973.
- Herschman, B. R. and Hagstrom, J. W. C.
Anomalous origin and course of the left coronary artery. *Ohio State M. J.* 69:36-38, 1972.
- Hsu, K. C.; Zimmerman, E. A.; Rudin, L.; LoGerfo, P.; Bennett, S. and Tannenbaum, M.
Application of immunoperoxidase bridge technique in studies of tumor tissues with antibody to tumor-associated antigen (TAA). In: *Proc. 2nd Conf. & Workshop on Embryonic & Fetal Antigens in Cancer*. Oak Ridge, Tenn., 1973, p. 147.
- Huth, F.; Wilde A.; Schulten, H. J.; Berger, S.; Davaris, P. and Baden, E.
X-ray, light and electronmicroscopic observations in experimental lymphostasis of the liver. *Angiologica* 9:40-52, 1972.
- Isenberg, H. D.; Isenberg, I. P.; Klavins, J. V.; Sawitsky, A. and Berkman, J. I.
Preliminary studies with *Phycomyces blakesleeana*, a model for ferritin biology. *Fed. Proc.* 31:700, 1972.
- Jao, W. and Pirani, C. L.
Renal amyloidosis: Observations. *Acta Path et Microbiol. Scandinav.* 80A(Suppl. 233) 217-227, 1972.
- Jao, W.; Pollak, V. E.; Norris, S. H.; Lewy, P. and Pirani, C. L.
Lipoid nephrosis: An approach to the clinical and pathologic analysis and dismemberment of idiopathic nephrotic syndrome with minimal glomerular changes. *Medicine* 52:455-468, 1973.
- Kacian, D. L.; Gambino, R.; Dow, L. W.; Grossbard, E.; Natta, C.; Ramirez, F.; Spiegelman, S.; Marks, P. A. and Bank, A.
Decreased globin messenger RNA in thalassemia detected by molecular hybridization. *Proc. Nat. Acad. Sc.* 70:1886-1890, 1973.
- Kaufman, Mavis A. and Roizin, L.
Neuropathology. In: *Progress in Neurology and Psychiatry. An Annual Review*, Vol. 27. E. A. Spiegel, ed. Grune & Stratton, New York, 1972.
- Kaunitz, Hans
Nutritional properties of coconut oil and its constituent fatty acids. *Philippine J. Internal Med.* 11:43, 1973.
- Kaunitz, Hans and Johnson, Ruth E.
Exacerbation of heart and liver lesions in rats by feeding of various mildly oxidized fats. *Lipids* 8:329-336, 1973.
- Fats and aging. *J. Jap. Oil Chemists' Soc.* 22:411-416, 1973.
- Chloride: Effect on morphology of heart, kidney, and testis in potassium-deficient rats. *Proc. Soc. Exper. Biol. & Med.* 141:875-878, 1972.
- Kaye, G. I.; Fenoglio, C. M.; Pascal, R. R. and Lane, N.
Comparative electron microscopic features of normal, hyperplastic and adenomatous human colonic epithelium. Variations in cellular structure relative to the process of epithelial differentiation. *Gastroenterology* 64:926-945, 1973.
- Kaye, G. I.; Fischbarg, J.; Fenoglio, C. M. and Hoeffle, F. B.
Morphologic and physiologic effects of perfusion of rabbit corneal endothelium with cytochalasin-B. *Anat. Rec.* 175:354, 1973.
- Kaye, G. I.; Hoeffle, F. B. and Donn, A.
Studies on the cornea. VIII. Reversibility of the effects of *in vitro* perfusion of the rabbit corneal endothelium with a calcium-free medium. *Invest. Ophthalmol.* 12:98-113, 1973.
- Kaye, G. I.; Sibley, R. C. and Hoeffle, F. B.
Recent studies on the nature and function of the corneal endothelial barrier. *Exper. Eye Res.* 15:585-614, 1973.
- Kino, O.; Richart, R. M. and Lattes, R.
Nuclear DNA in salivary gland tumors. I. Warthin tumors, benign mixed tumors and mucoepidermoid carcinomas. *Arch. Path.* 95:245-251, 1973.
- Nuclear DNA in salivary gland tumors. II. Adenocystic carcinomas. *Arch. Path.* 95:325-329, 1973.
- Kiyasu, J. Y. and Mathur, R.
On pertinent specifics of lecithin/sphingomyelin ratio. *J. Clin. Chem.* 19:1224-1225, 1973.
- Kiyasu, J. Y. and Napoles, D.
A screening program for detecting carbohydrate sensitivities. *Advances Autom. Anal.* 1:73-77, 1972.
- Kiyasu, J. Y. and Penn, O.
A clinically useful differentiation of serum alkaline phosphatase iso-enzymes in bone and liver diseases. *J. Clin. Chem.* 19:665, 1973.
- Klavins, J. F. and Wessely, Z.
Patterns of incorporation of thymidine in the female genital and other organs of mice, treated with 20-methylcholanthrene, estradiol and ovariectomy. *Oncology* 27:502-519, 1973.
- Lewis, J. L.; Nordqvist, S. R. B. and Richart, R. M.
Studies of nuclear DNA in vaginal adenosis and clear-cell adenocarcinoma. *Am. J. Obst. & Gynec.* 115:737-750, 1973.
- LiVolsi, V. A.; Feind, C. R.; LoGerfo, P. and Tashjian, A. H., Jr.
Demonstration by immunoperoxidase staining technique of hyperplasia of parafollicular cells in the thyroid gland in hyperparathyroidism. *J. Clin. Endocrinol.* 37, 1973.
- LiVolsi, V. A. and Jaretzki, A.
Granulomatous esophagitis. *Gastroenterology* 64:313-319, 1973.

- LiVolsi, V. A.; Perzin, K. P.; Badder, E. M.; Price, J. B. and Porter, M.
Granular cell tumors of the biliary tract. *Arch. Path.* **95**:13-17, 1973.
- LiVolsi, V. A.; Perzin, K. H. and Porter, M.
Polyarteritis nodosa of the gall bladder presenting as acute cholecystitis. *Gastroenterology* **65**:115-123, 1973.
- LoGerfo, P.; Herter, F.; LiVolsi, V. A. and Bennett, S.
Studies on tumor associated antigen. *J. Surg. Res.* **15**, October, 1973.
- Ludwig, A. S.; Okagaki, T.; Richard, R. M. and Lattes, R.
Nuclear DNA content of lobular carcinoma in situ of the breast. *Cancer* **31**:1553-1560, 1973.
- Lum, Gifford and Gambino, S. Raymond
A comparison of four methods for measuring uric acid: Copper-chelate, phosphotungstate, manual uricase & automated kinetic uricase. *Clin. Chem.* **19**:1184, 1973.
- MacMahon, Brian; Morrison, Alan S.; Ackerman, Lauren, V.; Lattes, Raffaele; Taylor, Herbert B. and Yuasa Shu
Histologic characteristics of breast cancer in Boston and Tokyo. *Internat. J. Cancer* **11**:338-334, 1973.
- Mandl, I.; Keller, S.; Fierer, J. A. and Evans, H. E.
The role of proteolytic enzyme inhibitors and connective tissue proteins in the maturation of the lung. In: *Respiratory Distress Syndrome*. C. Villee, ed. Academic Press, New York, 1973.
- Markesbery, W.; Cowen, D. and Duffy, P. E.
Granular cell tumors of the central nervous system. *J. Neuropath & Exper. Neurol.* **32**:92-109, 1973.
- Marsden, D. S.; Alexander, C.; Young, P.; Dunn, A. and Lazarevic, B.
Autoradiographic explanation for the uses of 99 mTc in gastric scintiphotography. *J. Nuclear Med.* **14**:632, 1973.
- Max, M. H.; Wolff, M.; Broell, John R. and Gump, F. E.
The effect of long term steroid therapy on the histopathology of regional enteritis. *J. Surg. Res.* **14**:124-132, 1973.
- Melicow, Meyer, M.; Uson, Aurelio C. and Veenema, Ralph J.
Malignant non-functioning pheochromocytoma of the organ of Zuckerkandl masquerading as a primary carcinoma of the prostate with metastases. *J. of Orol.* **110**:97-103, 1973.
- Mesa-Tcjada, R.; Ficrer, J. A.; Klavins, J. V.; Weiss, M. and Berkman, J. I.
Presence of fetal antigens in human malignant neoplasms as demonstrated by immunofluorescence microscopy. In: *Embryonic and Fetal Antigens in Cancer* (Conf. 720208). N. G. Anderson, J. H. Coggin, Jr., E. Cole and J. W. Holliman, eds. National Technical Information Service, U. S. Dept. of Commerce, Springfield, Va., 1972.
- Mesa-Tejada, R.; Weiss, M.; Klavins, J. V. and Berkman, J. I.
Human carcinoma antigens cross reacting with anti-placental antibodies. *Fed. Proc.* **31**:639, 1972.
- Miranda, Armand F. and Godman, Gabriel C.
The effects of cytochalasin D on differentiating muscle in culture. *Exper. Cell Res.* **77**:159-166, 1973.
- Miyoshi, K.; Wolf, A.; Harter, D.; Gamboa, E. and Duffy, P. E.
Murine influenza virus encephalomyelitis. *J. Neuro-path. & Exper. Neurol.* **32**:51-71, 1973.
- Momtazi, S. and Herbert, V.
Intestinal absorption using vibration-obtained individual small bowel epithelial cells of the rat: Folate absorption. *Am. J. Clin. Nutrition* **25**:23-29, 1973.
- Muehrcke, R. C. and Pirani, C. L.
Percutaneous renal biopsy. An adjunct to the study of renal disease. In: *Renal Disease*, 3rd ed. D. A. K. Black, ed. Blackwell Scientific Publ., Oxford, 1972, pp. 111-153.
- Naeye, R. L. and Blanc, W. A.
Unfavorable outcome of pregnancy. Repeated losses. *Am. J. Obst. & Gynec.* **116**:1133, 1973.
- Naeye, R. L.; Blanc, W. A. and Paul, C.
Effects of maternal nutrition on the human fetus. *Pediatrics* **52**:494, 1973.
- Natta, C.; Banks, J.; Niazi, G.; Marks, P. A. and Bank, A.
Decreased β globin mRNA activity in bone marrow cells in homozygous and heterozygous β thalassemia. *Nature*. **244**:280-281, 1973.
- Neuwirth, R. S.; Levine, R. U., and Richart, R. M.
Hysteroscopic tubal sterilization. I. A preliminary report. *Am. J. Obst. & Gynec.* **116**:82-85, 1973.
- Orenstein, Jan Marc and Weinstein, I. Bernard
Filamentous forms of enveloped A particles in cell cultures from chemically induced rat hepatomas. *Cancer Res.* **33**:1998-2004, 1973.
- Pascal, R. R.
Medullary cystic disease of the kidney. Study of a case with scanning and transmission electron microscopy and light microscopy. *Am. J. Clin. Path.* **59**:659-665, 1973.
- Pascal, R. R.; Koss, M. N. and Kassel, R. L.
Glomerulonephritis associated with immune complex deposits and viral particles in spontaneous murine leukemia. An electron microscopic study with immunofluorescence. *Lab. Invest.* **29**:159-165, 1973.
- Pestka, Sidney; Vincc, Robert; Daluge, Susan and Harris, Raymond
Effect of puromycin analogues and other agents on peptidylpuromycin synthesis in polyribosomes. *Antimicrob. Ag. & Chemotherapy*. **4**:37-43, 1973.
- Phillips, L. L.
Effect of prostaglandins on the coagulation mechanism of the pregnant rat. *Am. J. Obst & Gynec.* **115**:227, 1973.
- Phillips, L. L.; Rosano, L. and Skrodelsis, V.
Changes in factor XI (plasma thromboplastin antecedent) levels during pregnancy. *Am. J. Obst. & Gynec.* **116**:1114, 1973.

- Phillips, L. L.; Weiss, H. J.; Pessar, L. and Christy, N. P. Effects of puff adder venom on the coagulation mechanism. I. In vivo. *Toxicon* 11:423, 1973.
- Pirani, C. L.
The kidneys in scleroderma, rheumatoid arthritis, polyarteritis nodosa and renal vein thrombosis. In: *The Kidneys, Ureters and Urinary Bladder*. Vol. 8. CIBA Collection of Medical Illustrations, F. H. Netter, Ed., 1973.
- Roizin, L.; Hashimoto, S.; Liu, J. C. and Tom, K. J. Methadone neurotoxicity. III. Electron microscope investigations. *J. Neuropath & Exper. Neurol.* 32:180, 1973.
- Roizin, L.; Helpern, M.; Baden, M.; Kaufman, M. A.; Hashimoto, S.; Liu, J. C. and Eisenberg-Gelber, B.
The neuropathology of drug abuse. In: *Drug Abuse in Industry*. P. A. Carone and L. W. Krinsky, eds. Charles C. Thomas, Springfield, Ill., 1973, pp. 7-23.
- Shapiro, Lewis; Juhlin, Einar A. and Brownstein, Martin H.
Rudimentary polydactyly. *Arch. Dermat.* 108:223-226, 1973.
- Shapiro, Lewis; Teisch, Joel A. and Brownstein, Martin H.
Dermatohistopathology of chronic gonococcal sepsis. *Arch. Dermat.* 107:403-406, 1973.
- Simon, R. and Richart, R. M.
Nuclear DNA content of the normal and hypertrophied myocardium in the pediatric age group. *J. Pediat.* 83:445-450, 1973.
- Tannenbaum, M.
Ultrastructural pathology of the adrenal cortex. In: *Pathology Annual*, 1973. S. C. Sommers, ed. Appleton-Century-Crofts, New York, 1973, p. 109.
- Ts'chang, F.; Okagaki, T. and Richart, R. M.
Adenocarcinoma of Bartholin's gland associated with Paget's disease of vulvar area. *Cancer* 31:221-225, 1973.
- Tennyson, Virginia M.
Ultrastructural studies of sympathetic ganglia of the fetal, postnatal, and adult rabbit. *Anat. Rec.* 175:456, 1973a.
Fluorescence and electron microscopic studies of developing sympathetic neuroblasts in the fetal rabbit. In: *Proc. 3rd Annual Meeting of the Soc. for Neuroscience*, San Diego, Calif., Nov. 1973, p. 310.
- Tennyson, Virginia M.; Barrett, Robert E.; Cohen, Gerald; Cote, Lucien; Heikkila, Richard and Mytilineou, Catherine
Correlation of anatomical and biochemical development of the rabbit neostriatum. *Prog. Brain Res.* 40:203-217, 1973.
- Tennyson, Virginia M.; Brzin, Miro and Kremzner, Leon T.
Acetylcholinesterase activity in the myotube and muscle satellite cell of the fetal rabbit: An electron microscopic-cytochemical and biochemical study. *J. Histochem. & Cytochem.* 21:634-652, 1973.
- Tennyson, Virginia M.; Bytilineou, Catherine and Barrett, Robert E.
Fluorescence and electron microscopic studies of the early development of the substantia nigra and area ventralis tegmenti in the fetal rabbit. *J. Comp. Neurol.* 149:233-257, 1973.
- Tennyson, Virginia M.; Cohen, Gerald; Mytilineou, Catherine and Heikkila, Richard
6,7-Dihydroxytetrahydroisoquinoline: Electron microscopic evidence for uptake into the amine-binding vesicles in sympathetic nerves of rat iris and pineal gland. *Brain Res.* 51:161-169, 1973.
- Tennyson, Virginia M. and Marco, Luis
Intrinsic connections of caudate neurons. II. Fluorescence and electron microscopy following chronic isolation. *Brain Res.* 53:307-317, 1973.
- Thompson, Bruce H.; Woodruff, J. Donald; Davis, Hugh J.; Julian, Conrad G. and Silva, Fred G. II.
Cytopathology, histopathology and colposcopy in the management of cervical neoplasia. *Am. J. Obst. & Gynec.* 114:329-333, 1972.
- Tisman, G. and Herbert, V.
In vitro myelosuppression and immunosuppression by ethanol. *J. Clin. Invest.* 52:1410-1414, 1973.
B₁₂ dependence of cell uptake of serum folate: An explanation for high serum folate and cell folate depletion in B₁₂ deficiency. *Blood* 41:465-469, 1973.
- Tisman, G.; Herbert, V. and Edlis, H.
Determination of therapeutic index of drugs by in vitro sensitivity tests using human host and tumor cell suspensions. *Cancer Chemother. Rep.* 57:11-19, 1973.
- Tisman, G.; Herbert, V.; Go, L. T. and Brenner, L.
Marked immunosuppression with minimal myelosuppression by bleomycin in vitro. *Blood* 41:721-726, 1973.
- Tisman, G.; Herbert, V. and Rosenblatt, S.
Evidence that lithium induces human granulocyte proliferation. Elevated serum vitamin B₁₂ binding capacity in vivo and granulocyte colony proliferation in vitro. *Brit. J. Haemat.* 24:765-769, 1973.
- Tomashefsky, P.; Lattimer, J. K.; Priestley, J., Jr.; Furth, J.; Valili, B. F. and Tannenbaum, M.
An experimental Wilms tumor suitable for therapeutic and biological studies. II. The inhibition of renal compensatory hypertrophy by a transplantable tumor. *Invest. Urol.* 11:141, 1973.
- Ueda, Gaiko; Moy, Peggy; and Furth, Jacob
Multihormonal activities of normal and neoplastic pituitary cells as indicated by immunohistochemical staining. *Internat. J. Cancer* 12:100-114, 1973.
- Urm, E.; Leisinger, T. and Vogel, H. J.
Magnesium sensitivity of L-aspartate:2-oxoglutarate aminotransferase in *Escherichia coli*. *Biochim. Biophys. Acta* 302:249-260, 1973.
- Veith, F. J. and Hagstrom, J. W. C.
Histological alterations in human lung transplants. In: *Morphology in Lung Transplantation*. C. R. H. Wildevuur, ed. S. Karger, Basel, Switzerland, 1973, pp. 23-26.

- Veith, F. J.; Koerner, S. K.; Hagstrom, J. W. C.; Attai, L.; Bloomberg, A.; Jacobson, E.; Nagashima, H.; Boley, S. J. and Gleidman, M. L.
Experience in clinical lung transplantation. *J.A.M.A.* **222**:779-782, 1972.
- Veith, F. J.; Sinha, S.; Siegelman, S. S.; Gleidman, M. L., Hagstrom, J. W. C.
Canine lung allograft rejection with and without immunosuppression. In: *Morphology in Lung Transplantation*. C. R. H. Wildevuur, ed. S. Karger, Basel, Switzerland, 1973, pp. 85-95.
- Veith, F. J.; Sinha, S.; Torres, M.; Chandler, P.; Blumcke, S. and Hagstrum, J. W. C.
Lung morphology in dogs surviving chronically after left lung reimplantation with or without right pulmonary artery ligation. In: *Morphology in Lung Transplantation*, C. R. H. Wildevuur, ed. S. Karger, Basel, Switzerland, 1973, pp. 218-222.
- Wainberg, Mark A.; Howe, Calderon and Godman, G. C.
Enhancement of Sendai virus mediated cell fusion by cupricion. *J. Cell Biol.* **57**:388-396, 1973.
- Weiss, H. J.; Phillips, L. L.; Hopewell, W. S.; Phillips, G. B., Christy, N. P. and Nitti, J. F.
Heparin therapy in a patient bitten by a saw-scaled viper (*Echis carinatus*), a snake whose venom activates prothrombin. *Am. J. Med.* **54**:653, 1973.
- Wessely, Z.; Guerry, R. L. and Klavins, J. V.
Disseminated fibromuscular hyperplasia of vascular channels. *Arch. Path.* **96**:179, 1973.
- Wit, A. L.; Fenoglio, J. J.; Wagner, B. M. and Bassett, A. L.
Electrophysiological properties of cardiac muscle in the anterior mitral valve leaflet and adjacent atrium; possible implications for the genesis of atrial dysrhythmias. *Circulation Res.* **32**:731-745, 1973.
- Woff, M.
Lymphangiomyoma: Clinicopathologic study and ultrastructural confirmation of its histogenesis. *Cancer* **31**:988-1007, 1973.
Paraganglioma of the gallbladder. *Arch. Surg.* **107**:493, 1973.
- Wolff, M.; Santiago, H. and Duby, M. M.
Delayed distant metastasis from a subcutaneous sacrococcygeal ependymoma. Case report with tissue culture, ultrastructural observations and review of literature. *Cancer* **30**:1046-1067, 1972.
- Zegarelli, D. J.; Tsukada, Y., Pickren, J. W. and Greene, G. W.
Metastatic tumor to the tongue. *OS, OM, OP*, **35**:202-211, 1973.
- Zegarelli, D. J. and Zegarelli, E. V.
Radiolucent lesions in the globulomaxillary region. *J. Oral Surg.* **31**:767-771, 1973.
- Zimmerman, E. A.; Hsu, K. C.; Robinson, A. G.; Carmel, P. W.; Frantz, A. G. and Tannenbaum, M.
Studies of neurophysin secreting neurons with immunoperoxidase techniques employing antibody to bovine neurophysin. I. Light microscopic findings in monkey and bovine tissues. *Endocrinology* **92**:931, 1973.

Pediatrics

RICHARD E. BEHRMAN

Professor and Chairman of the Department • Director of Service

The Department of Pediatrics and the staff of Babies Hospital, The Children's Medical and Surgical Center of New York, have participated in an increasing number of community health programs for the children of New York City in addition to increasing their ability to serve as a referral center for sick children by developing special services. The renovation of the amphitheater, the Pediatric Radiology floor, the expanded Neonatal Intensive Care Unit and premature nursery, and the transitional care nursery were completed. Moreover, the full-time and part-time faculty of the Department increased significantly.

Changes in Staff and Honors

Dr. Louis Z. Cooper was appointed Professor of Pediatrics and Director of the Pediatric Service at Roosevelt Hospital. He continues as director of the Rubella Project, an established center for research, training and service which uses a multidisciplinary approach including physicians, public health nurses, social workers, and other specialists to develop and evaluate an appropriate model of comprehensive services for children with complex birth defects. Dr. Michael Katz, Professor of Pediatrics, was appointed Director of the Division of Infectious Diseases of the Department of Pediatrics and Babies Hospital. He was also elected to the American Pediatric Society. The Division was expanded by the addition of Dr. Jane Pitt, who was appointed Assistant Professor of Pediatrics, and Dr. William Speck, who was awarded the Rustin McIntosh Fellowship by the Babies Hospital Alumni Association.

Dr. Catherine DeAngelis joined the Division of Pediatric Ambulatory Care as Assistant Professor of Pediatrics and Public Health. Ms. Sylvia Morgan, audiologist, and Ms. Arlene Falk, speech pathologist, were appointed Instructors in Clinical Pediatrics, and Mr. Frank Haymson was appointed Administrative Manager of the Pediatric Clinic. Dr. Narayan Shah was appointed Assistant Professor of Pediatrics and joined the Division of Pediatric Hematology and Oncology. Dr. James A. Wolff, Professor of Pediatrics and Director of the Division, was appointed member of the Special Competency Committee in Pediatric Hematology of the American Board of Pediatrics.

In the Division of Perinatology Dr. M. Richard Koenigsberger was appointed Assistant Professor of Pediatrics and Neurology and Dr. Leonard Indyk, Assistant Professor of Medical Physics (Pediatrics). Dr. Michael Lewis was appointed Adjunct Professor of Pediatric Psychology and Dr. Thomas Vogl, Adjunct Professor of Radiation Physics (in Radiology).

In the Division of Growth and Development Dr. Myron Winick, Professor of Pediatrics and Director of the Institute of Human Nutrition, was appointed the R. R. Williams Professor of Nutrition. He was also appointed to the Committee on Nutrition of the American Academy of Pediatrics. Dr. Jo Anne Brasel was elected Secretary-Treasurer of the Society for Pediatric Research, and Dr. Pedro Rosso was appointed Assistant Professor of Pediatrics (in Obstetrics and Gynecology and the Institute of Human Nutrition).

Drs. Robert Winters and Ralph Dell received

awards as career scientists from the Health Research Council of the City of New York. Dr. William Heird was elected to the Society for Pediatric Research.

Dr. Welton Gersony, Director of the Division of Pediatric Cardiology, was elected to the Executive Committee of the Cardiology Section of the American Academy of Pediatrics and chaired the annual scientific sessions of the American Heart Association on congenital heart disease. Dr. Carl Steeg was appointed Head of the Pediatric Cardiovascular Laboratory and was voted "Teacher of the Year" by the medical students of the College of Physicians and Surgeons. Dr. Allan Hordof was appointed Associate in Clinical Pediatrics.

Drs. Robert Mellins was elected to membership in the American Pediatric Society. Dr. Carolyn Denning assumed the Chairmanship of the National Cystic Fibrosis Research Foundation Care, Teaching and Research Committee. Dr. Irwin Mohr was appointed Associate in Clinical Pediatrics (Psychology) and Mrs. Muriel Gluckson was appointed Staff Associate in Genetics for the Cystic Fibrosis Clinics.

Dr. William J. Davis, Director of the Allergy Division, served as Chairman, Clinics and Education Committee of the New York Allergy Society and organized a symposium, "Advances in Allergy and Immunology," held at Babies Hospital. Dr. Bernard R. Feldman is President elect of the New York Allergy Society (1974-75) and Dr. Armand V. Mascia was appointed Assistant Clinical Professor of Pediatrics in the Allergy Division.

Dr. Akira Morishima was elected to the American Pediatric Society and appointed to Community Board 14 and the Steering Committee of Comprehensive Health Planning Board District E.

Dr. John Nicholson was appointed Secretary of Community Board 12. Dr. Stephen Glaser was elected Chairman of the Pediatric Section of the Medical Society of New York State. Dr. Thomas Blumenfeld was elected Chairman, Committee on Pediatric Clinical Chemistry, American Association of Clinical Chemists. Dr. William Bauman was elected Trustee for the Society of Computer Medicine and Chairman of the Bio-Engineering Section of the New York Academy of Medicine.

Dr. Calvin Sinnette, Director of the Division of Community and Social Pediatrics, was promoted to Professor of Clinical Pediatrics. He was appointed to the Advisory Council of Children's Aid Society of New York. Dr. Vivian Iglehart was appointed to the Special Committee on Child Welfare of the Medical Society of the County of New York, and Mrs. Constance Rogers, R.N., was appointed to

serve on the Advisory Committee on School Health and Family Living, New York City Board of Education.

Dr. Stuart Stevenson resigned as Professor of Pediatrics and Director of the Pediatric Service at St. Luke's Hospital. Dr. Doris Wethers was appointed Acting Director and was promoted to Assistant Clinical Professor of Pediatrics.

The following appointments were made to the full-time Pediatric faculty (Roosevelt Hospital): Assistant Professor of Pediatrics, Drs. Philip R. Ziring and Julian L. Brower; Assistant Professor of Clinical Child Development (Pediatrics), Ms. Madeline Appell; Instructors in Clinical Pediatrics, Drs. William R. Brown, Marina Corpus, and Nathan E. Saint-Amand.

Dr. Erich J. Kahn resigned as Director of the Pediatric Service of Harlem Hospital but will remain Acting Director until a successor is appointed. Drs. Gene-Ann Polk and Wiener LeBlanc were promoted to Associate Professors of Clinical Pediatrics. Dr. Yusuf M. Khakoo joined the service at Harlem as Assistant Professor of Clinical Pediatrics and Clinical Hematologist. Dr. Jeanne Fenner joined the faculty as Assistant Professor of Clinical Pediatrics and Neonatologist. Dr. Araceli R. Ancajas was appointed Assistant Director of Pediatric Ambulatory Care. Dr. June Mulvaney was appointed Instructor in Clinical Pediatrics. Drs. Hugh E. Evans and Leonard Glass resigned to assume positions as Director and Associate Director of Pediatrics, respectively, at Brooklyn Jewish Hospital.

The following joint appointments were made: Dr. Sidney Carter was appointed Professor of Neurology and Pediatrics; Dr. James F. Hammill, Associate Professor of Clinical Neurology and Clinical Pediatrics; Dr. Arnold Gold, Associate Professor of Clinical Neurology and Clinical Pediatrics; Dr. Abe Chutorian, Associate Professor of Clinical Neurology and Clinical Pediatrics; Dr. Niels Low, Associate Professor of Clinical Neurology and Clinical Pediatrics; Dr. Alan Hyman, Associate Professor of Anesthesiology and Pediatrics; and Dr. David Rush, Associate Professor of Public Health (Epidemiology) and Pediatrics.

The following received promotions: Associate Clinical Professors of Pediatrics, William A. Bauman, Solomon J. Cohen, Chris P. Katsampes; Assistant Professor of Pediatrics, Cyril A. L. Abrams; Assistant Clinical Professors of Pediatrics, Alexander Blum, Burton M. Feinsmith, David J. Franklin, Gustave Gavis, Thurman B. Givan, I. Bruce Gordon, Bertram H. Grossman, Dean N. Martin, Margare

Rice, John S. Rosmaita, Martin B. Vita, Matilda B. Brust; Associate in Clinical Pediatrics, Louis Rodrigues; and Instructor in Clinical Pediatrics, Martha L. Amarant.

The following new appointments were made to the part-time staff: Eduardo J. Agasso, Doris K. E. Goldberg, Anthony B. Minnefor, Phienvit Tantibhedhyangkul (Assistant Clinical Professors); Solomon Chazan, John Costa, Morton J. Seligman (Instructors in Clinical Pediatrics); and Matthew Feldman, Robert A. Herzlinger, Ruth Peters, Geoffrey Redmond, Gloria Schrager, Dennis J. Allendorf, Ricarda L. Baum, Khin Hnin Lwin (Assistants in Clinical Pediatrics).

The following individuals resigned from the staff: Kathleen Catalano, Robert Jennings, Gerald Lieberman, Rawle McIntosh, Thomas J. Moore, Carl Strande, and Robert West.

Education

A joint teaching program for medical students and house staff was initiated by the Divisions of Infectious Diseases of the Departments of Pediatrics and Medicine. The Pediatric Diagnostic Laboratory of Babies Hospital also established a training program of office practice bacteriology for the pediatric house staff.

In the Division of Pediatric Ambulatory Care Dr. DeAngelis initiated a training program for pediatric nurse practitioners; nurses from Presbyterian, Roosevelt, St. Luke's, and Harlem Hospitals have enrolled. Drs. Russell Asnes and Burton Grebin developed postgraduate continuing education programs for Washington Heights community physicians and pharmacists aimed at improving the level of child care and attracting physicians and pharmacists to the community and improving relationships with the Medical Center.

Dr. Blumenfeld conducted a workshop on problems in pediatric clinical chemistry at the 25th National Meeting of the American Association of Clinical Chemists.

Dr. Nicholson served as Chairman of the Education Committee of the Neighborhood Action Program of the Office of Neighborhood Government of the City of New York and was instrumental in obtaining the allocation of over \$150,000 to various projects involving education and day care in the neighborhood surrounding the Medical Center.

A new course in Child Development and Child Therapy was instituted for residents by Dr. H. Donald Dunton, Director of the Division of Child Psychiatry.

A program of pediatric ambulatory care seminars

and clerkship assignments to the Comprehensive Care Clinic at the National Health Studies Program was initiated at St. Luke's Hospital.

Research

Dr. Katz is investigating the properties of isolated viruses from patients with subacute sclerosing paranecephalitis to define markers for identification of these agents, and Dr. Pitt initiated studies of mechanisms of bacterial resistance to antimicrobial and intraphagocytic killing. Dr. Speck, working in the laboratory of Dr. Herbert Rosenkranz (Microbiology), began studies of the mutagenic potential of bilirubin photodegradation products. Drs. Katherine Sprunt, Asnes, and Grebin developed a system of rapid reporting of group A beta hemolytic streptococci in clinic patients; this group, with Dr. Speck, is also investigating the efficacy of oral clindomycin in children.

The staffs of the Division of Pediatric Ambulatory Care and the Center for Community Health Systems, with a Planning Grant from The Robert Wood Johnson Foundation, carried out a series of pilot studies of child health services in upper Manhattan; they are developing a series of proposals to investigate and improve the way in which care is provided to these children. Collaborative research into childhood poisonings and crib deaths is also being conducted with Mt. Sinai, Albert Einstein and Montefiore Hospitals.

Drs. Wolff, Anneliese L. Sitarz, and Shah are continuing studies of the most effective treatment of children with leukemia and solid tumors. Investigations of the use of prophylactic transfusions in the management of sickle cell anemia and of vitamin C and disferroxamine in the management of thalassemia were also initiated.

In the Newborn Lung Center Drs. Blumenfeld and Werner Meier are investigating L/S ratios in the tracheal aspirates as an index for diagnosis and survival prediction of infants with severe respiratory distress syndrome. Initial results of Drs. Winters, Heird, and John M. Driscoll indicate that positive nitrogen balance can be achieved and weight loss reduced by providing these infants with intravenous alimentation. Drs. Nicholson and Heird are studying plasma amino acid patterns and assessing the role of ornithine in the control of mitochondrial ammonia fixation in these patients. Drs. Driscoll's and Koenigsberger's follow-up study of 150 high-risk infants treated with ventilators for the respiratory distress syndrome suggests that these infants have an excellent prognosis. Dr. L. Stanley James, Dr. Ming-Neng Yeh (Obstetrics and Gynecology), and Dr. Hisayo

Morishima (Anesthesiology) are investigating the mechanisms responsible for abnormal fetal heart rate patterns; they determined that transient acceleration from cord occlusion is due to a sympathetic response and that the late deceleration pattern is principally caused by hypoxia. Dr. Tove Rosen initiated a study of clinical, biochemical, and neurologic changes in infants born of addicted mothers and those under the methadone program.

Drs. Nestor Truccone and Gersony are studying hemodynamic effects of exercise and isoproterenol in children with valvular heart disease. Drs. Steeg, Paul Cannon (Medicine), and Gersony also initiated computerized radioactive isotope techniques to determine quantitatively pulmonary and systemic blood flows and intracardiac shunting.

Drs. Mellins, Sungming Park, Ralph Epstein (Anesthesiology), Mary Jane Farrell, and Jordan Spencer are investigating the effect of sleep in the ventilatory response to CO₂ in the first few months of life using noninvasive techniques. Drs. Davis, Leila Pang, Frank Rodriguez-Martinez, and Mellins initiated a study to measure the effectiveness of terbutaline, a B₂ adrenergic agent, in acute asthmatic attacks and status asthmaticus. Drs. Davis, Nicholson, and Charles Pippinger (Neurology) are also developing a microassay for plasma theophyllins to facilitate more accurate treatment of asthmatic children. Dr. Denning is continuing her investigation of the impact of cystic fibrosis on patients and families. Drs. Denning, Pureza Gaerlan, and Zacharias Dische are also studying glycoprotein components in saliva and gastric fluid, and Drs. Celia Ores and Rose Falco, disaccharidase levels in jejunal tissue of these patients. Dr. Gilbert Mellin developed a computerized patient registry for cystic fibrosis and other pulmonary and gastrointestinal conditions.

Dr. Ruth Harris initiated a screening program for detecting galactose-1-phosphate uridyl transferase in all newborn infants in New York City in order to identify the frequency of this disorder in various ethnic groups and evaluate the clinical manifestations of associated enzyme variants. Drs. Silverman, Dunton, and Raymond Vande Wiele (Obstetrics and Gynecology) began a clinical study of nutrition and development in ballerinas. Drs. Leah Beck and John K. Lattimer (Urology) are studying sexual functioning of adults who have undergone repair of hypospadias in childhood. Drs. Morishima, Milstein, and Gabriel Nahas (Anesthesiology) initiated an investigation of the altered DNA synthesis in cells obtained from marijuana smokers.

The Pediatric Satellite Clinical Research Unit was

opened under the Directorship of Dr. Heird. Thirty-seven patients were admitted under eight different research protocols and the occupancy for April through September was 70.3 per cent.

Drs. Dell and Cannon (Medicine) are studying regional renal, myocardial, and cerebral blood flow utilizing the ¹³³Xenon washout technique. Drs. Dell and DeWitt Goodman (Medicine) are employing mathematical models to investigate the kinetics of long-term turnover of plasma cholesterol and protein.

Patient Care

The admissions to Babies Hospital, the Children's Medical and Surgical Center of New York, of children and youths from birth to 21 years and visits to the Pediatric Clinics increased from 10 per cent to 15 per cent during 1973. Occupancy in the intensive care units showed the greatest increase and averaged 95 per cent. The Division of Infectious Diseases of the Department of Pediatrics and Babies Hospital initiated a new program for consultation coverage at all times. The Babies Hospital Diagnostic Bacteriology Laboratory under Dr. Sprunt initiated a program of monitoring inhalation therapy equipment in Babies Hospital and with Drs. Mellin and Bauman started daily monitoring and computer reporting of antibiotic sensitivities and bacterial isolations.

The responsibility for administering outpatient care for children was transferred from Vanderbilt Clinic to Babies Hospital. This change resulted from the recognition of the advantages of analyzing and evaluating pediatric medical care services.

Miss M. Burke joined the pediatric oncology and surgical groups to provide direct supervision of all children undergoing chemotherapy. She is also in charge of the Pediatric Tumor Registry.

Drs. Michael Pesce, Nicholson, and Blumenfeld directed the almost complete conversion of the Babies Hospital Clinical Chemistry Laboratory to microautomation, permitting more rapid determination of a greater number and variety of tests at less cost with greater quality control.

During the past year the Medical Intensive Care Transport vehicle was redesigned and became operational under the direction of Dr. R. Epstein. It transferred infants from seven suburban hospitals as well as from within New York City in collaboration with the Health and Hospitals Corporation. An enlarged fetal monitoring program in obstetrics also was initiated by members of the Division of Perinatology, resulting in a marked reduction in the duration of intensive care required for infants born of monitored labors. A program for school age children to receive

care and treatment in the Allergy Clinic after school hours was established by Dr. Davis. A network of Cystic Fibrosis Clinics was established by Drs. Denning and Gaerlan in Staten Island, Brooklyn, and the South Bronx. The Monday afternoon Cystic Fibrosis Clinic was made an Adolescent and Young Adult Clinic. The patients meet with Dr. Irwin Mohr, Psychologist, and Miss P. Riccio, Medical Social Worker, as well as their physicians.

The Division of Pediatric Psychiatry of Babies Hospital assumed responsibility for all adolescent psychiatric consultations in The Presbyterian Hospital.

Hemodialysis is now available to pediatric patients in a newly opened unit. The Medical Center's first kidney transplant in a pediatric patient took place during the year. Drs. Eugene Klenk and Winters are responsible for the care of such patients.

Drs. Stanley Morrison and Roger S. Challop initiated the Washington Heights Pediatric Group Community medical practice. Dr. Challop also established a Pica Clinic at St. Luke's Hospital.

The Division of Community and Social Pediatrics completed tubercular testing and vision and hearing screening in 1,759 children in the Harlem School Project. Physical screening was conducted in 883 children; 113 were referred for further diagnosis, and 215 for dental services. The vocational rehabilitation program of the Comprehensive Sickle Cell Center enrolled 24 patients, and a summer camp program was established for patients and their siblings. A total of 2,086 individuals was screened for abnormal hemoglobin.

Dr. Nicholson served as consultant to the New York Diabetic Association and the Center for Prevention of Premature Arteriosclerosis. Drs. Mellin and Charles Ryder (Orthopaedic Surgery) are developing a computerized admissions and discharge record system for the affiliated New York State Research and Rehabilitation Hospital at West Haverstraw.

Acknowledgments

The Department gratefully acknowledges the contributions of many individuals and organizations that supported its efforts in patient care, teaching, and research during 1973. Among the donors were: National Institutes of Health, Robert Wood Johnson Foundation, Health Research Council of the City of New York, New York Fund for Children,

Narco, Frost-Corwin Foundation, IBM Corporation, Mr. and Mrs. W. R. Mullen, Thelma & Milton Petrie Corporation, Mr. and Mrs. Meslow, Mr. Miltner, The Seymour Feldman Memorial Fund, Sloper-Willen Community Ambulance Services, Sunday School of Church on the Hill, Mr. and Mrs. Weir, Dr. and Mrs. Tillis and friends, Waldo Foundation, Astra Pharmaceutical Corporation, Mr. and Mrs. R. Bernstein, Mrs. S. Betts, Mr. and Mrs. Bursiel, Mrs. G. Garrett, Mr. and Mrs. C. E. Hillock, Maplewood Junior Women's Club, Stephanie Kossoff Memorial Fund, National Cystic Fibrosis Research Foundation, Mr. and Mrs. R. P. Olney, Mr. H. M. Rankin, J. J. Rosenberg Memorial Fund, Manhattan Chapters of National Cystic Fibrosis Research Foundation, Mr. and Mrs. H. Tuttle, Mr. F. B. Vanderbilt, Kanzler Fund, Mr. and Mrs. J. Maxtone-Graham, Mr. and Mrs. Weideger, Mr. and Mrs. A. E. Adams, Miss M. Grossmann, Mr. and Mrs. Stanley L. Sloane, Mrs. David L. Guyer, Mr. and Mrs. Francis X. Gina, Mr. and Mrs. Sidney Singer, Jr., Milbank Memorial Fund, Dr. Harry S. Altman, Dr. Beulah Parker, Mr. and Mrs. Alexander F. Treadwell, Dr. Agnes Wilson, Dr. and Mrs. J. Taylor Howell, Dr. and Mrs. F. Howell Wright, Dr. Elinor F. Downs, Dr. Stephen L. Madey, Dr. Anthony G. Stigliano, Dr. Rhoda Mickey, Dr. J. H. Ebbs, Dr. Katherine K. Merritt, Dr. Jerry C. Jacobs, Dr. John Drucker, Dr. L. H. Sanders, Dr. Walter M. Chemris, Dr. Robert West, Dr. Charles L. Wood, Dr. Paul de Sant'Agnes, Dr. B. H. Grossman, Dr. R. J. McKay, Dr. Arthur E. Laidlaw, Dr. Roderick Richards, Dr. and Mrs. Douglas S. Damrosch, Dr. James W. Bennett, Dr. Edward C. Curnen, Jr., Dr. Joseph A. Silverman, Dr. Morton H. Rachelson, Dr. Hilde Bruch, Dr. Thomas V. Santulli, Dr. Arnold P. Gold, Dr. Hugh F. Leahy, Dr. Anneliese Sitarz, Dr. David V. Habif, Dr. Charles L. Wood, Dr. Robert Hui, Miss Elizabeth Callahan, Dr. J. Doering, Dr. Peter Scaglione, Dr. Sidney Blumenthal, Dr. Paul Strong, Dr. G. Wolff, Dr. Sidney Chipman, Dr. Herbert Kehr, Dr. Harry Abrams, Dr. John S. Rosmaita, Dr. Conrad Riley, The Chase Foundation, Maxwell Leeds Pediatric Tumor Foundation, Abbott Laboratories, The Kidney Foundation of New York, The London Company, Mead-Johnson Laboratories, Ross Laboratories, Wyeth Laboratories, McGraw Laboratories, J. Pfrimmer & Co., and royalties contributed by Drs. Dell, Engel, and Winters.

1973 Publications

Pediatrics

- Abramson, H.; Bertles, J. F. and Wethers, D. L.
Editors, *Sickle Cell Disease*. C. V. Mosby Co., St. Louis, Mo., 1973.
- Asnes, R. S. and Grebin, B.
Practical antibiotic therapy in children. *Am. Fam. Phys.* 8:194, 1973.
- Asnes, R. S.; Maqbool, S. and Grebin, B.
The inaccuracy of paper medicine cups: A warning. *J. Pediat.* 83:848, 1973.
- Asnes, R. S.; Vail, D.; Grebin, B. and Sprunt, K.
Anal carrier rate of group A beta hemolytic streptococci in children with streptococcal pharyngitis. *Pediatrics* 52:438-441, 1973.
- Bauman, W. A.
Inpatient information system. *New York J. Med.* 73:2248-2252, 1973.
- Behrman, R. E.
Editor, *Neonatology: Diseases of the Fetus and Infant*. C. V. Mosby Co., St. Louis, Mo., 1973.
- Bemporad, J.
Cognitive growth and childhood psychopathology: The concept of finality. *Child Psych. & Human Develop.* 3, 1973.
The role of the other in some forms of psychopathology. *J. Am. Acad. Psychoanal.* 1, No. 4, 1973.
- Blumenfeld, T. A.
Specimen collection, interpretation of data and future applications of clinical microchemistry. In: *Proc. International Symposium on Microchemical Techniques*. University Park, Pennsylvania, 1973.
- Brasel, J. A.
Newer tools for the diagnosis of malnutrition. *Pediat. Ann.* 2:18, 1973.
- Brasel, J. A.; Jasper, H. G. and Winick, M.
Influence of hormones on cell growth. In: *Dietary Lipids and Postnatal Development*. C. Galli, G. Jacine, and A. Pecile, eds. Raven Press, New York, 1973.
- Dell, R. B.
Normal acid-base regulation. Chapter 2. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
Pathophysiology of dehydration. Chapter 7. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
Diabetic ketoacidosis. Chapter 19. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Dell, R. B.; Sciacca, R.; Case, D. B. and Cannon, P. J.
A weighted least squares technique for the analysis of kinetic data and its application to the study of renal ¹³³Xe washout in dogs and man. *Circ. Res.* 32:71-84, 1973.
- Dell, R. B. and Winters, R. W.
From Henderson-Hasselbalch to Henderson: A better way to teach? *J. Pediat.* 83:372-373, 1973.
Microanalysis of blood acid-base status. In: *Advances in Microchemistry*. M. V. Werner, ed. Charles C Thomas, Springfield, Ill., 1973.
- Driscoll, J. M., Jr.
Infants of addicted mothers. In: *Neonatology: Diseases of the Fetus and Infant*. R. E. Behrman, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
Parenteral therapy in the neonatal infant. In: *Neonatology: Diseases of the Fetus and Infant*. R. E. Behrman, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
Physical examination of the neonatal infant. In: *Neonatology: Diseases of the Fetus and Infant*. R. E. Behrman, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
Routine and special neonatal care. In: *Neonatology: Diseases of the Fetus and Infant*. R. E. Behrman, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
- Driscoll, J. M., Jr., and Heird, W. C.
Maintenance fluid therapy during the neonatal period. Chapter 14. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Driscoll, J. M., Jr. and James, L. S.
Practical aspects of evaluation and resuscitation of the newborn. Chapter 12. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Driscoll, J. M., Jr. and Mellins, R. B.
Idiopathic respiratory distress syndrome of infancy (hyaline membrane disease) basics of RD. In: *Proc. American Thoracic Society, June, 1973*, vol. 1, No. 5.
- Edie, R. N.; Ellis, K.; Gersony, W. M.; Krongrad, E.; Bowman, F. O., Jr. and Malm, J. R.
Surgical repair of single ventricle. *J. Thor. & Cardiovasc. Surg.* 66:350, 1973.
- Evans, H.; Akpata, S. O.; Baki, A. and Glass, L.
Annual variation in prevalence of *S. aureus*, *E. coli* and streptococci in the flora of newborn infants. *Arch. Environ. Health* 26:275-276, 1973.
- Gaerlan, P. F.; Mandel, I. D.; Denning, C. R. and Lorin, M. I.
Electrolyte content of lacrimal secretions of cystic fibrosis patients and normal control individuals. *Cystic Fibrosis Club Abstracts. Fourteenth Annual Meeting*, San Francisco, California, 1973.
- Gersony, W. M.
Digitalis dosage and blood levels in the pediatric age group. *ACCEL*, 5, 1973.
Obstruction to pulmonary venous return obscured by decreased pulmonary blood flow. *Chest* 64:283, 1973.
Persistence of the fetal circulation. *J. Pediat.* 82:1103, 1973.
- Gersony, W. M.; Bathany, S.; Bowman, F. O., Jr. and Malm, J. R.
Late follow-up of patients evaluated hemodynamically after total correction of tetralogy of Fallot. *J. Thor. & Cardiovasc. Surg.* 66:209, 1973.

- Goodman, DeW. S.; Noble, R. P. and Dell, R. B.
The effects of colestipol resin and of colestipol plus clofibrate, on the turnover of plasma cholesterol in man. *J. Clin. Invest.* **52**:2646-2655, 1973.
- A three-man pool model of the long-term turnover of plasma cholesterol in man. *J. Lipid Res.* **14**:178-188, 1973.
- Harris, Ruth C.
Alkaline phosphatase values in children. *J. Pediat.* **82**:361-362, 1973.
- Hayes, C. J.; Gersony, W. M.; Griffiths, S. P.; Steeg, C. N.; Bowman, F. O., Jr. and Malm, J. R.
Results of correction of total anomalous pulmonary venous return in infancy. *Advances Cardiol.* **2**:888, 1973.
- Heird, W. C.; Driscoll, J. M., Jr. and Winters, R. W.
Total intravenous nutrition in infants. Chapter 33. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Heird, W. C.; Grebin, B. and Winters, R. W.
Fluid and electrolyte therapy in the newborn infant. Chapter 7. In: *Resuscitation of the Newborn Infant*. 3rd ed. H. Abramson, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
- The stabilization of disorders of water, electrolyte and acid-base metabolism in newborn infants under intensive care. In: *Resuscitation of the Newborn Infant*. H. Abramson, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
- Heird, W. C. and Winters, R. W.
Complications of the pediatric surgical patient. Chapter 31. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- The pediatric surgical patient. Chapter 30. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Horowitz, S. L. and Morishima, A.
Palatal abnormalities in the syndrome of gonadal dysgenesis. *Mammal. Chromosome Newsl.* **14**:52, 1973.
- Jasper, H. D. and Brasel, J. A.
Effects of growth hormone on DNA polymerase activity in the liver of normal and hypophysectomized rats. *Endocrinology* **92**:194, 1973.
- Influence of hormones on cell growth. *Pediat. Ann.* **2**:46, 1973.
- Kahn, Erich J.
Obesity in childhood. In: *The Psychology of Obesity: Dynamics and Treatment*. N. Kiell, ed. Charles C. Thomas, Springfield, Ill., 1973.
- Kesner, L.; Yao, T.-T. and Dell, R. B.
Determination of total organic acids in urine by extraction with organic solvents. *Clin. Chem.* **19**:593-596, 1973.
- King, D. L.; Steeg, C. N. and Ellis, K.
Demonstration of transposition of the great vessels by cardiac ultrasonography. *Radiology* **107**:181-186, 1973.
- Klenk, E. L. and Winters, R. W.
Disorders of aldosterone secretion. Chapter 23. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Disorders of antidiuretic hormone secretion. Chapter 22. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Koenigsberger, M. R.; Patten, B. M. and Lovelace, R. E.
Studies of myoneural junction in normal full-term, premature and hypermagnesemic newborn infants (Abstract). *Pediat. Res.* **7**:193, 1973.
- Krongrad, E.; Steeg, C. N.; Waldo, A. L. and Gersony, W. M.
The response of the atrioventricular specialized conduction system (AVSCS) to rapid atrial stimulation (RAS) in children. *Pediat. Res.* **7**:299/71, 1973.
- Lattimer, J. K.; Vakili, B. F.; Smith, A. M. and Morishima, A.
A natural-feeling testicular prosthesis. *J. Urol.* **110**:81, 1973.
- Levine, O. R.; Rodriguez-Martinez, F. and Mellins, R. B.
Fluid filtration in the lung of the intact puppy. *J. Appl. Physiol.* **34**:683-686, 1973.
- Mellin, G. W. and Hosmer, M. E.
The computer as an aid in monitoring in vitro antibiotic sensitivity testing. *Pediat. Res.* **7**:149, 1973.
- Mellins, R. B.
Cardiorespiratory disorders in children. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Milstein, M.; Morishima, A.; Warburton, D. and Schullinger, J. N.
On the origin of true hermaphroditism: XX/XY mosaicism. *Mammal. Chromosome Newsl.* **14**:64, 1973.
- Morishima, H. O.; Glaser, B.; Niemann, W. H.; Daniel, S. S. and James, L. S.
Increased uterine activity and fetal deterioration during experimental hyperthermia. *Proc. 43rd Annual Meeting Soc. Pediat. Res.*, 1973.
- Murty, V. L. N.; Gaerlan, P. F.; Denning, C. R. and Dische, Z.
The relation to calcium of the insoluble glycoprotein fraction in the submaxillary saliva of cystic fibrosis patients and controls. *Cystic Fibrosis Club Abstracts, 14th Annual Meeting*, San Francisco, Calif. 1973.
- Neu, Harold C.; Cherubin, C.; Vogt, M.; Huber, P.; Glaser, S. and Winter, H.
Antibiotic resistance of fecal *Escherichia Coli*. *Am. J. Dis. Child.* **126**:174-177, 1973.
- Patterson, P. R.; Denning, C. and Kutscher, A. H.
Editors, *Psychosocial Aspects of Cystic Fibrosis*. Columbia University Press, New York, 1973.
- Rodriguez-Martinez, F.; Mascia, A. V. and Mellins, R. B.
The effect of environmental temperature on airway resistance in the asthmatic child. *Pediat. Res.* **7**:627-631, 1973.

- Rosso, P.; Diggs, J. and Winick, M.
Changes in alkaline ribonuclease activity during compensatory renal growth. *Proc. Nat. Acad. Sc.* **70**:169, 1973.
- Rosso, P.; Nelson, M. and Winick, M.
Changes in cellular RNA content and alkaline ribonuclease activity in rat liver during development. *Growth* **37**:143, 1973.
- Rosso, P. and Winick, M.
Relation of nutrition to physical and mental development. *Pediat. Ann.* **2**:33, 1973.
- Rush, D.
The Columbia study. In: *Nutritional Supplementation and the Outcome of Pregnancy*. H. Jacobson and M. Winick, eds. National Academy of Sciences. Washington, D. C., 1973, pp. 73-81.
Environmental effects on fetal growth. *Proc. Mead Johnson Symposium on Perinatal and Developmental Medicine*. **II**, 1973.
Perinatal mortality, race, social status, and hospital of birth: The association with birthweight. In: *The Problem of Congenital Defects: New Directions*. D. T. Janerich, R. G. Skalko, I. H. Porter, eds. Academic Press, New York, 1973.
- Rush, D.; Davis, H. and Susser, M. W.
Antecedents of low birthweight: Maternal weight, height, age, parity, weight-gain and history of prior low birthweight delivery re-examined in Harlem, New York City. In: *Uses of Epidemiology in Planning Health Services*. A. M. Davies, ed. Savremena Administracija, Belgrade, 1973, pp. 371-377.
- Rush, D.; Stein, Z. and Susser, M. W.
The rationale for and design of a randomized controlled trial of nutritional supplementation in pregnancy. *Nutrition Rep. Internat.* **7**, No. 5, 1973.
- Shah, N. and Wolff, J. A.
Thiamine deficiency: Probable Wernicke's encephalopathy successfully treated in a child with acute lymphocytic leukemia. *Pediatrics* **51**:750-751, 1973.
- Sigulem, D. M.; Brasel, J. A.; Velasco, E. G.; Rosso, P. and Winick, M.
Plasma and urine RNase as a measure of nutritional status in children. *Am. J. Clin. Nutrition* **26**:793, 1973.
- Simpson, J. M.; Clark, J. L.; Challop, R. S. and McCabe, E. B.
Elevated blood lead levels in children—A 27-city neighborhood survey. *Health Services Rep.* **88**:419-422, 1973.
- Speck, William T.
Calcium, phosphorus and magnesium metabolism. Chapter 15. In: *Neonatology: Diseases of the Fetus and Infant*. R. E. Behrman, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
Special orthopedic problems. Chapter 19. In: *Neonatology: Diseases of the Fetus and Infant*. R. E. Behrman, ed. C. V. Mosby Co., St. Louis, Mo., 1973.
- Sprunt, K.; Redman, W. and Leidy, G.
Antibacterial effectiveness of routine handwashing. *Pediatrics* **52**:264-271, 1973.
- Steeg, C. N.; Ellis, K. and Gersony, W. M.
Total anomalous pulmonary venous drainage with ventricular septal defect. *Am. Heart J.* **86**:341-346, 1973.
- Truccone, N. J.; Spotnitz, H. M. and Gersony, W. M.
Cardiovascular effects of propranolol and practolol in puppies. *Pediat. Res.* **7**:300/72, 1973.
- Velasco, E. G.; Brasel, J. A.; Sigulem, D. M.; Rosso, P. and Winick, M.
Effects of vascular insufficiency on placental RNase activity. *J. Nutrition* **103**:213, 1973.
- Wethers, D. L.
Sickle cell disease. *New York Med.* **29**, No. 9, 1973.
Sickle cell screening programs; Letter to the editor. *J. Pediat.* **83**:171, 1973.
- Williams, G. S.; Klenk, E. L. and Winters, R. W.
Acute renal failure in pediatrics. Chapter 27. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Winick, M.
Relation of nutrition to physical and mental development. In: *Bibl. "Nutr. Diet."* J. C. Somogyi, ed. S. Karger, Basel, 1973.
Editor, *Nutrition and Development*. Interscience Publishers, New York, 1973.
- Winick, M. and Brasel, J. A.
Nutrition and cell growth. In: *Modern Nutrition in Health and Disease*. R. S. Goodhart and M. E. Shils, eds. Lea & Febiger, Philadelphia, 1973.
- Winick, M.; Brasel, J. A. and Rosso, P.
Nutrition and cell growth. In: *Nutrition and Development*. M. Winick, ed. Interscience Publishers, New York, 1973.
- Winick, M.; Brasel, J. A. and Velasco, E. G.
Effects of prenatal nutrition upon pregnancy risk. *Clin. Obst. & Gynec.* **16**:184, 1973.
- Winick, M. and Rosso, P.
Nutritional effects on brain DNA and proteins. In: *Dietary Lipids and Postnatal Development*. C. Galli, G. Jacine, and A. Pecile, eds. Raven Press, New York, 1973.
- Winters, R. W.
Maintenance fluid therapy. Chapter 6. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown, & Co., Boston, 1973.
Metabolic alkalosis of pyloric stenosis. Chapter 21. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
Salicylate intoxication. Chapter 25. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
Physiology of acid-base disorders. Chapter 3. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
Regulation of normal water and electrolyte metabolism. Chapter 5. In: *The Body Fluids in Pediatrics*. R. W. Winters, ed. Little, Brown & Co., Boston, 1973.
- Yeh, M.; Morishima, H. O. and James, L. S.
Myocardial conduction defects and fetal bradycardia. *Proc. 43rd Annual Meeting, Soc. Pediat. Res.*, 1973.

Pharmacology

BRIAN F. HOFFMAN

Hosack Professor and Chairman of the Department • Pharmacologist

The Department notes with deep regret the death, on May 11, 1973, of Herbert J. Bartelstone, Professor of Pharmacology and Dentistry. Dr. Bartelstone had been associated with the Department since 1950 and made outstanding contributions to its educational and research programs. The Department has established the Herbert J. Bartelstone Awards in Pharmacology, which will be made each year to a medical and a dental student in the graduating classes who have demonstrated exceptional knowledge of the field.

During the year Dr. Kenneth E. Eakins was appointed Associate Professor of Pharmacology and Ophthalmology with tenure and Dr. Michael R. Rosen was promoted to Assistant Professor. Dr. Peter K. T. Pang was promoted to Associate and Mr. Samuel M. Ross, to Associate (Electrical Engineering). The title of Dr. Elizabeth E. LeBourhis was changed from Associate to Adjunct Assistant Professor. Dr. Arthur L. Basset left the Department to accept a position as Associate Professor of Pharmacology at the University of Miami, and Dr. William G. Kelly resigned to accept an appointment as Professor of Biochemistry and Obstetrics and Gynecology at the University of Minnesota. Dr. Hiroko Nishimura accepted an appointment as Assistant Professor of Physiology at the University of Tennessee Medical Units in Memphis. Dr. Klaus Pleshka returned to the Max Planck Institute and Dr. Shigaharu Nagasawa, to the Institute of Protein Research in Osaka, Japan. Dr. F. James Brennan and Francis M. Weld completed their research training in phar-

macology and entered the cardiology training program of the Department of Medicine.

The Division of Clinical Pharmacology continued to make rapid progress in programs of instruction and research. Drs. Norman Kahn and J. Thomas Bigger, Jr., Directors of the Division, and Mr. Meir Florenz continued their development of computer-assisted demonstrations in pharmacokinetics with support of a grant from the National Fund for Medical Education. The goal of this program is to evolve a computer-based instructional system for improving the pharmacotherapeutic skills of those involved in health care. The system will provide a number of interactive computer programs to explain and graphically demonstrate the behavior of drugs in simple model systems, realistic computer models to serve as guides for clinical therapy, and simulated clinical case problems. Drs. Bigger and Kahn also organized a medical student elective, "Therapeutics and Clinical Pharmacology," to provide research experience for selected students.

The Department continued its efforts to develop postgraduate educational programs in pharmacology and related fields. Dr. Lance L. Simpson served as course director for the postgraduate program in psychopharmacology and in April presented a course on "Drug Abuse: Narcotics and Psychotomimetics." Drs. Andrew L. Wit and Michael R. Rosen organized a series of courses on cardiac electrophysiology and pharmacology. The first of these, on the recognition and treatment of re-entrant arrhythmias, was held in November.

Dr. Lowell M. Greenbaum continued to serve as Director of the graduate training program in pharmacology. Two new students, Charles Steer and Guy Orangio, were admitted as candidates for the Ph.D. degree, and three, Peter Friedman, Michael Siegal, and Jonathan Rosenberg, were admitted as joint M.D.-Ph.D. candidates. Continuing their studies are Ardith Bondi, Kenneth Dangman, Peter Danilo, Jr., Diana Gazis, Hrayr Karaguezian, Hsheng-Kai Lee, Mitchell Liebowitz, Marjorie McConnell, John Gorham Palfrey, Jr., Hreday Sapru, Eric Spokas, Jay Wiggins, and Mildred Yang. The appointments of Drs. S. Dorothy Chou, Arnold Hassan, and Martha Johnston as postdoctoral trainees were renewed. Dr. Peter Grebow is a newly appointed postdoctoral trainee working with Dr. Lowell Greenbaum. Drs. John Desmond Allen, Rosemary Pang, Ajai Prakash, Sadhanna Sathe, and Eugene Schoener were appointed as Research Associates and Dr. Joel Kuper-smith's appointment was continued.

Research

Dr. Greenbaum continued his collaboration with Dr. Martha Johnston, recipient of a Smith, Kline and French Fellowship, and Dr. Ajai Prakash, a fellow of the U.S.P.H.S., in studies concerned with formation of ascites fluid in neoplastic disease. These investigations, in collaboration with Dr. Henry Frick (Obstetrics and Gynecology), demonstrated that pharmacologically active peptides known as leukokinins are present in such fluids and may be causally related to the fluid accumulation. With Mr. Mitchell Liebowitz, a graduate student, Dr. Greenbaum continued studies of the lung's ability to metabolize chemical mediators such as angiotensin and bradykinin.

Dr. Wilbur H. Sawyer and Mrs. Margot Acosta, in collaboration with Dr. Maurice Manning of the Medical College of Ohio, studied the effects of structural changes in the antidiuretic hormone molecule that enhance activity, specificity, and duration of antidiuretic action. Structural analogues have been designed that appear to provide substantial improvements in their prolonged action and freedom from side effects. Drs. Peter Pang and Rosemary K. Pang are studying the physiology of calcium balance in fishes with particular emphasis on the effects of removal of the pituitary gland and the corpuscles of Stannius. With Drs. Martin P. Schreiber and Robert W. Griffith of Brooklyn College, and Dr. Sawyer, they also studied endocrine influences on sodium exchanges between euryhaline fishes and their environments. Drs. Pang and Dr. Sawyer also demonstrated for the first time that prolactin has specific effects on sodium balance in the mud puppy,

Necturus maculosus. Dr. Nishimura extended her studies on the influences of external salinity on the activity of the renin-angiotensin system in fishes and investigated the cardiovascular and renal responses of conscious eels to mammalian and endogenous angiotensin.

Dr. Edward B. Kirsten, with Drs. S. C. Wang and Schoener, completed studies describing the effects of dextroamphetamine on motion-modulated vestibular neurons in cats. With Ms. Karen Lustig, Dr. Kirsten initiated studies of the characteristics of vestibular cell membranes, and with Ms. Ardith Bondi, a graduate student, is studying the effects of verapamil on calcium movement in skeletal muscle.

Dr. Wit, with Mr. Peter Friedman, a Medical Scientist candidate, and Dr. John Fenoglio (Pathology), continued to study the electrophysiological properties of cardiac Purkinje and muscle fibers after experimental myocardial infarction. Drs. Wit and Brennan also investigated the effects of antiarrhythmic drugs on cardiac cells which survive infarction. Drs. Wit and Fenoglio continued their collaborative studies with Dr. Arthur L. Bassett of the University of Miami on the electrophysiological properties of cardiac muscle in the atrioventricular valves. Drs. Wit, Fenoglio and Rosen began a collaborative study with Drs. Wagner (Pathology) and Larry Tille, Chief of Cardiology at the Animal Medical Center in New York, on the pathophysiology of naturally occurring cardiac arrhythmias in dogs.

Drs. Le Bourhis and Frederick G. Hofmann completed a study of the subcellular distribution of adenylylase activity and the effect of cyclic AMP on adrenal and testicular steroidogenesis. They are continuing their studies on developmental aspects of steroidogenesis in the fetal guinea pig. Drs. Le Bourhis and Sawyer are studying the metabolic degradation of vasopressin and its analogues by soluble enzyme systems obtained from the kidney.

Drs. Bigger and Weld studied the effect of high concentrations of lidocaine on the rapid inward Na^+ currents in cardiac Purkinje fibers and showed that lidocaine shifts only slightly the curve relating the rate of action potential depolarization to the steady state transmembrane voltage while exerting a very large effect on the rate of recovery from inactivation of the Na^+ current. They also demonstrated the ability of lidocaine in low concentrations to increase the K^+ conductance of cardiac Purkinje fibers and repolarize damaged fibers.

Drs. Elsa G. V. Giardina and Bigger are collaborating with Drs. Jacques Dreyfuss and Eric Schreiber (Squibb Institute for Medical Research) in an effort to characterize the metabolism of procaine amide.

Working with the ^{14}C -procaine amide, they showed that man acetylates this molecule, but that acetylation may vary from 10% to 70%.

Drs. Reiffel (Medicine), Bigger, and Giardina are continuing to evaluate human sinus node function and to characterize the effect of cardioactive drugs and the autonomic nervous system on sinus node activity.

With Dr. Ronald L. Katz (Anesthesiology), Dr. H. H. Wang compared cardiovascular effects of sodium nitroprusside and trimethaphan, and with Mr. David Chiu, a senior medical student, studied the effects of various types of ischemia on skeletal muscle. With Dr. Pleschka, she studied the changes in lingual blood flow during panting produced by heat or drugs in conscious dogs, and with Drs. B. F. Hoffman and Harold Bush (Surgery) she is studying various techniques for cardioplegia.

Dr. S. C. Wang was on sabbatical leave and returned in February of 1973. During this leave he worked in the Pharmacological Institute, University of Basel, Basel, Switzerland, on the central and peripheral sites of action of antitussive agents. He is currently continuing this project with Dr. Tseng. Drs. S. C. Wang and Schoener studied the neural mechanism by which sodium acetylsalicylate produces defervescence in cats and with Dr. Hassen Dr. Wang is trying to ascertain which respiratory center component is most affected by morphine. With Dr. Lee, a graduate student, he studied the meiotic action locus of morphine in dogs and with Mr. Sapru, also a graduate student, he is investigating baroreceptor resetting in the spontaneously hypertensive rat.

Dr. Paul F. Craneheld, with Drs. B. F. Hoffman, Wit, Aronson, and Wiggins, continued to study the electrical activity of cardiac Purkinje fibers under conditions in which their normal action potentials are replaced by the "slow response" form of electrical activity. Dr. B. F. Hoffman, with Drs. Krongrad (Pediatrics) and James R. Malm (Surgery) and Frederick O. Bowman, Jr. (Surgery), continued studies on the electrophysiology of the human heart and the causes and treatment of conduction disturbances and arrhythmias.

Activities

Dr. F. G. Hofmann continued to serve as Associate Dean for Admissions for the College of Physicians and Surgeons. He continues as a member of the Publications Committee of the Endocrine Society and the Editorial Boards of *Endocrinology* and *Proceedings of the Society for Experimental Biology and Medicine*. Dr. Greenbaum was appointed chairman of a special Task Force on support of Training

and Research of the American Society for Pharmacology and Experimental Therapeutics. He participated in the 1972 Intra-Science Symposium on Drug Metabolism and the International Symposium on Inflammation held in May in Rebeiro Preto, Brazil. Dr. Kirsten was elected to membership in the Society for Neuroscience. Dr. Kahn continued to serve as course director for the course in Pharmacology for medical and dental students. He was elected Secretary of the Section on Pharmacology and Therapeutics of the American Association of Dental Schools and was Invited Discussant at the joint meeting of the sections of Physiology and Pharmacology and Therapeutics of the A.A.D.S. on the Pharmacology of Pain. Dr. Kahn was also an Invited Discussant at the American College of Clinical Pharmacology's Workshop on "Clinical Pharmacology in the Medical Curriculum." Dr. Kahn continued to serve on the Editorial Advisory Board of *Neuropharmacology* and as Consulting Pharmacologist to the Formulary Committee of the Harlem Hospital.

Dr. Wilbur H. Sawyer continues to serve on the General Medicine B Study Section, Division of Research Grants, N.I.H., and on the Editorial Boards of *Endocrinology* and the *Journal of General and Comparative Endocrinology*. He continues to serve on the Faculty Council, its Committee on Appointments and Promotions, and its Executive Committee.

Dr. Bigger served on the Editorial Board of *Circulation* and the Pharmacology A Study Section of the Institute of General Medical Sciences, N.I.H. He was elected a Fellow of the Council on Clinical Cardiology of the American Heart Association. Dr. Bigger delivered a Special Lecture at the Annual Scientific Session of the American Heart Association in Dallas, Texas, November 1972, entitled "Clinical Implications of Reentry for Arrhythmia Induction" and gave the Reynolds Lecture at The Bowman Gray School of Medicine on December 1, 1973 on "The Evaluation of Sinoatrial Node Function in Man." Dr. Wit continued to serve as Adjunct Assistant Professor at the Rockefeller University. Dr. B. F. Hoffman continued to serve as Director of the Medical Scientist Training Program at the College of Physicians & Surgeons and as a member of the Special Program Committee of the National Heart and Lung Institute. He continues to serve as a member of the Advisory Council for Research of the New York Heart Association and as an Adjunct Professor in the Rockefeller University. Dr. Craneheld continues to serve as Editor of the *Journal of General Physiology* and as a member of the editorial boards of *Circulation Research* and the *Journal of Electrocardiography*.

1973 Publications

Pharmacology

- Antman, E. M.; Kupersmith, J. and Hoffman, B. F.
Electrophysiologic effects of lidocaine in canine acute myocardial infarction. *Circulation* 48 (IV):108, 1973.
- Aronson, R. S.; Gelles, J. M. and Hoffman, B. F.
Effect of ouabain on the current underlying spontaneous diastolic depolarization in cardiac Purkinje fibers. *Nature* 245:118-120, 1973.
A new method for producing short cardiac Purkinje fibers suitable for voltage clamp. *J. Appl. Physiol.* 34:527-530, 1973.
- Bassett, A. L. and Gelband, H.
Chronic partial occlusion of the pulmonary artery in cats: Changes in ventricular action potential configuration during early hypertrophy. *Circ. Res.* 32:15-25, 1973.
- Bassett, A. L. and Wit, A. L.
Recent advances in electrophysiology of antiarrhythmic drugs. *Prog. Drug. Res.* 17:33-58, 1973.
- Biancani, P.; Bejar, J.; Spiro, H. M.; Weiss, R. M. and Zabinski, M. P.
Lower esophageal sphincter mechanics. *Physiologist* 16:266, 1973.
- Biancani, P.; Weiss, R. M. and Zabinski, M. P.
Bi-dimensional creep in the obstructed ureter. *Proc. 26th Ann. Conf. Eng. Med. Biol.* 15:339, 1973.
- Biancani, P.; Weiss, R. M.; Zabinski, M. and Bassett, A. L.
Effects of reserpine on bi-dimensional deformation of rabbit ureter. *Fed. Proc.* 32:795, 1973.
- Biancani, P.; Zabinski, M. and Weiss, R. M.
Bidimensional deformation of the acutely obstructed *in vitro* rabbit ureter. *Am. J. Physiol.* 225:671-674, 1973.
- Bigger, J. T., Jr.
Arrhythmias and antiarrhythmic drugs. *Adv. Intern. Med.* 18:251-281, 1973.
Mechanisms of digitalis toxic arrhythmias and the clinical recognition of digitalis toxicity. In: *Contraversies in Clinical Pharmacology and Drug Development*. R. F. Palmer, ed. Futura Publishing Co., Mount Kisco, N.Y., 1972, pp. 125-135.
Antiarrhythmic drugs in ischemic heart disease. *Hosp. Practice* 7:69-80, 1972.
Electrical properties of cardiac muscle and possible causes of cardiac arrhythmias. In: *Cardiovascular Arrhythmias*. L. S. Dreifus and W. Likoff, eds. Grune & Stratton, New York, 1973.
- Bigger, J. T., Jr. and Giardina, E. G. V.
The pharmacology and clinical use of lidocaine and procaine amide. *Med. Coll. Virginia Quart.* 9:67-78, 1973.
- Bigger, J. T., Jr. and Strauss, H. C.
The evaluation of sinoatrial node function in man. *Med. Coll Virginia Quart.* 9:79-87, 1973.
- Brennan, F. J. and Wit, A. L.
Effects of lidocaine on electrophysiological properties of Purkinje fibers surviving acute myocardial infarction. *Circulation* 48 (IV):148, 1973.
- Chai, C. Y.; Hsu, P. L. and Wang, S. C.
Central locus of emetic action of digitalis substances in cats. *Neuropharmacology* 12:1187-1193, 1973.
- Chan, W. Y.; Chiu, Peter, J. S. and Sawyer, W. H.
Responses of rat kidney and toad bladder to the pentapeptide ring: Structures of neurohypophysial hormones. *Proc. Soc. Exper. Biol. & Med.* 143:954, 1973.
- Chang, J.; Freer, R.; Stella, R. and Greenbaum, L. M.
Studies on the formation and chemical properties of leukokinins M and PMN. *Biochem. Pharmacol.* 21:3095, 1972.
- Chiu, D. and Wang, H. H.
Tolerance of skeletal muscle to ischemia produced by pneumatic tourniquet. *Fed. Proc.* 32:345, 1973.
- Cohen, S. I.; Kupersmith, J.; Aroesty, J. and Rowe, J. W.
Pulsus paradoxus and Kussmaul's sign in acute pulmonary embolus. *Am. J. Cardiol.* 32:271, 1973.
- Crane, P. F.; Wit, A. L. and Hoffman, B. F.
The genesis of cardiac arrhythmias. *Circulation* 47:190, 1973.
- Danilo, P.; Vulliamoz, Y.; Verosky, M. and Rosen, M. R.
Activation of cardiac Purkinje fiber adenyl cyclase by beta-adrenergic amines. *Fed. Proc.* 32:773, 1973.
- Dreyfuss, J.; Bigger, J. T., Jr. and Schreiber, E. C.
Metabolism of procainamide in man and monkey and N-acetylprocainamide in the monkey. *Clin. Pharmacol. & Therap.* 13:366-371, 1972.
- Fenoglio, J. J. and Wagner, B. M.
Studies in rheumatic fever. VI Ultrastructure of chronic rheumatic heart disease. *Am. J. Path.* 72:623-640, 1973.
- Freer, R.; Chang, J. and Greenbaum, L. M.
Studies on the pharmacological properties of leukokinins. *Biochem. Pharmacol.* 21:3107, 1972.
- Friedman, P. L.; Fenoglio, J. J., Jr. and Wit, A. L.
Myocardial infarction: Ultrastructural and electrophysiological correlations. *Circulation* 48 (IV):166, 1973.
- Friedman, P. L.; Stewart, J. R.; Fenoglio, J. J. and Wit, A. L.
Survival of subendocardial Purkinje fibers after extensive myocardial infarction in dogs; *In vivo* and *in vitro* correlations. *Circ. Res.* 33:553-569, 1973.
- Friedman, P. L.; Stewart, J. R.; Hoffman, B. F. and Wit, A. L.
Myocardial infarction arrhythmias; study of electrophysiologic mechanisms using microelectrodes. *Fed. Proc.* 32:431, 1973.
- Friedman, P. L.; Stewart, J. R. and Wit, A. L.
Spontaneous and induced cardiac arrhythmias in subendocardial Purkinje fibers surviving extensive myocardial infarction in dogs. *Circ. Res.* 33:570-586, 1973.

- Friedman, R. C.; Kornfeld, D. S. and Bigger, J. T., Jr.
Psychological problems associated with sleep deprivation in interns. *J. Med. Education* 48:436-441, 1973.
- Gelband, H. and Bassett, A. L.
Altered electrical and mechanical properties of right ventricular myocardium in cats with experimentally induced right ventricular hypertrophy. *Pediat. Res.* 7:303-375, 1973.
- Depressed transmembrane potentials during experimentally induced ventricular failure in cats. *Circ. Res.* 32:625-634, 1973.
- Giardina, E. G. V. and Bigger, J. T., Jr.
Action of procaine amide against human reentrant ventricular arrhythmias. *Circulation* 48:959-970, 1973.
- Giardina, E. G. V.; Bigger, J. T., Jr.; Yu, E. and Rolnitzky, L.
Antiarrhythmic action of lidocaine on ventricular arrhythmias in man. *Circulation* 45-46 (II):155, 1972.
- Giardina, E. G. V.; Heissenbuttel, R. H. and Bigger, J. T., Jr.
Intermittent intravenous procaine amide to treat ventricular arrhythmias: Correlation of plasma concentration with effect on arrhythmia, electrocardiogram, and blood pressure. *Ann. Int. Med.* 78:183-193, 1973.
- Gliklich, J.; Gaffney, R.; Rosen, M. R. and Hoffman, B. F.
Cardiac effects of AY-22,241. *Fed. Proc.* 32:686, 1973.
- Greenbaum, L. M.; Semente, G. R. and Prakash, A.
Pepstatin inhibition of leukokinin and ascites formation. *Fed. Proc.* 32:846, 1973.
- Griffith, R. W.; Pang, P. K. T.; Srivastava, A. K. and Tickford, G. E.
Serum composition of freshwater stringrays (Potamotrygonidae) adapted to fresh and dilute sea water. *Biol. Bull.* 144:304-320, 1973.
- Hoffman, B. F.
Basic biomedical research: Its impact on drug discovery. In: *Drug Discovery; Science and Development in a Changing Society. Advances in Chemistry Series 108*. Glenn Ulliyott, ed. American Chemical Society, Washington, D. C., 1971.
- Electrophysiologic mechanisms for conduction abnormalities. *Chest* 63:651, 1973.
- Johnston, M. and Greenbaum, L. M.
Leukokinin-forming system in the ascitic fluid of a murine mastocytoma. *Biochem. Pharmacol.* 22:1386, 1972.
- Purification of leukokinin. *Fed. Proc.* 32:475, 1973.
- Kelly, W. G. and Rizkallah, T. H.
Dissimilar isotopic ratios in urinary estrogens following simultaneous injection of Δ^4 -androstenedione- ^{14}C and estrone-6,7- ^3H . *J. Clin. Endocrinol.* 36:196-199, 1973.
- Kirsten, E. B. and Lustig, K. C.
Effects of AHR-2666 on frog skeletal muscle. *Physiologist* 16:364, 1973.
- Kirsten, E. B. and Schoener, E.
Action of anticholinergic and related agents on single vestibular neurons. *Neuropharmacology* 12:1167-1177, 1973.
- Kirsten, E. B. and Tseng, T. C.
Effects of tybamate and pentylenetetrazol on spinal interneurons. *Experimentia* 28:1459-60, 1972.
- Klein, H. O.; Lebson, R.; Cranefield, P. F. and Hoffman, B. F.
Effect of extrasystoles on idioventricular rhythm. Clinical and electrophysiologic correlation. *Circulation* 47:758-764, 1973.
- Klein, H. O.; Singer, D. H. and Hoffman, B. F.
Effects of atrial premature systoles on sinus rhythm in the rabbit. *Circ. Res.* 32:480-491, 1973.
- Krongrad, E.; Merker, C.; Fenoglio, J. J.; Bassett, A. L. and Rosen, M. R.
Electrophysiologic-electrocardiographic correlations studies in the isolated canine heart. *Fed. Proc.* 32:447, 1973.
- Krongrad, E.; Rosen, M. R.; Merker, C.; Fenoglio, J. and Hoffman, B. F.
Creation of trifascicular block in isolated blood-perfused canine hearts. *Circulation* 48 (IV):21, 1973.
- Krongrad, E.; Waldo, A. L.; Kupersmith, J.; Saroff, A. L.; Bowman, F. O., Jr. and Hoffman, B. F.
Observation on the human left ventricular activation sequence. *Am. J. Cardiol.* 31:143, 1973.
- Kupersmith, J.; Krongrad, E.; Saroff, A. L. and Waldo, A. L.
Studies in pacing of the human specialized conduction system during open heart surgery. *Am. J. Cardiol.* 31:143, 1973.
- Kupersmith, J.; Krongrad, E. and Waldo, A. L.
Conduction intervals and conduction velocity in the human cardiac conduction system: Studies during open heart surgery. *Circulation* 47:776, 1973.
- Manning, M.; Balaspiri, L.; Acosta, M. and Sawyer, W. H.
Solid phase synthesis of [1-deamino, 4-valine]-8-D-arginine-vasopressin (DVEDAVP), a highly potent and specific antidiuretic agent possessing protracted effects. *J. Medicinal Chem.* 16:975, 1973.
- A new synthetic analog of vasopressin with greatly enhanced antidiuretic specificity, activity and duration of action. *Pharmacologist* 15:240, 1973.
- Manning, M.; Coy, E. J.; Acosta, M. and Sawyer, W. H.
Solid-base synthesis and some pharmacological properties of deamino-4-threonine analogs of the vasopressins and vasotocin and [deamino] arginine-vasotocin. *J. Medicinal Chem.* 16:836, 1973.
- Manning, M.; Coy, E. J.; Sawyer, W. H. and Acosta, M.
Solid-phase synthesis and some pharmacological properties of 4-threonine analogs of vasopressins and vasotocin and of arginine-vasopressin and arginine-vasotocin. *J. Medicinal Chem.* 16:463, 1973.
- McGuire, E. J.; Weiss, R. M. and Baskin, A. M.
Neoplasms of transitional cell origin in the first twenty years of life. *Urology* 1:57-59, 1973.
- Nishimura, H.; Ogawa, M. and Sawyer, W. H.
Renin-angiotensin system in primitive bony fishes and a holocephalian. *Am. J. Physiol.* 224:950-956, 1973.

- Nosaka, S. and Wang, S. C.
Baroreceptor reflex functions in the spontaneously hypertensive rat. In: *A Symposium on Spontaneous Hypertension—its Pathogenesis and Complications*. K. Okamoto, ed. Igaku Shoin Ltd., Tokyo, 1971, pp. 79-82.
- Pang, P. K. T.; Griffith, R. W. and Schreiber, M. P.
The pituitary gland and calcium metabolism in *Fundulus disphanius* (Teleostei). *Gen. Comp. Endocrinol.* **20**:358-361, 1973.
- Pang, P. K. T.; Pang, R. K. and Sawyer, W. H.
Effects of environmental calcium and replacement therapy on the killifish, *Fundulus heteroclitus*, after the surgical removal of the corpuscles of Stannius. *Endocrinology* **93**:705-710, 1973.
- Rosen, M. R.; Albert, D. and Weiss, R. M.
Determinants of resting membrane potential in a clonal cell line of murine neuroblastoma. *Fed. Proc.* **32**:222, 1973.
- Rosen, M. R. and Gelband, H.
Effects of ouabain on canine Purkinje fibers *in situ* or perfused with blood. *J. Pharmacol. & Exper. Ther.* **186**:366, 1973.
- Rosen, M. R.; Gelband, H. and Hoffman, B. F.
Correlation between effects of ouabain on the canine electrocardiogram and transmembrane potentials of isolated Purkinje fibers. *Circulation* **47**:65-72, 1973.
- Rosen, M. R.; Gelband, H. and Merker, C.
Significance of ouabain induced low amplitude potentials in the induction of cardiac arrhythmias. *Am. J. Cardiol.* **21**:155, 1973.
- Rosen, M. R.; Gelband, H.; Merker, C. and Hoffman, B. F.
Mechanisms of digitalis toxicity: Effects of ouabain on phase four of canine Purkinje fiber transmembrane potentials. *Circulation* **47**:681, 1973.
- Rosen, M. R. and Hoffman, B. F.
Mechanisms of action of antiarrhythmic drugs. *Circ. Res.* **32**:1-8, 1973.
- Rosen, M. R.; Merker, C.; Gelband, H. and Hoffman, B. F.
Effects of procaine amide on the electrophysiologic properties of the canine ventricular conducting system. *J. Pharmacol. & Exper. Ther.* **185**:438, 1973.
- Rosen, M. R.; Merker, C. and Pippenger, C. E.
Effects of clinically relevant plasma lidocaine concentrations on electrophysiologic properties of canine Purkinje fibers. *Circulation* **48** (IV):209, 1973.
- Sawyer, W. H.
Discussion: Endocrines and osmoregulation among fishes. *Am. Zool.* **13**:815-817, 1973.
Neurohypophysial hormones and water and sodium excretion in the African lungfish. *Gen. Comp. Endocrinol.* (III):345-349, 1973.
- Sawyer, W. H. and Manning, M.
A new synthetic analogue of vasopressin with greatly enhanced antidiuretic specificity and activity. Program, Endocrine Soc. 75th Meeting, 1973.
Synthetic analogs of oxytocin and the vasopressins. *Ann. Rev. Pharmacol.* **13**:5-17, 1973.
- Schiff, M., Jr.; Weiss, R. M.; Kraus, P. and Lytton, B.
Acute urinary retention following renal transplantation. *Urology* **1**:108-110, 1973.
- Shield, D. E. and Weiss, R. M.
Leiomyoma of the female urethra. *J. Urol.* **109**:430-431, 1973.
- Simpson, L. L.
Spontaneous hypertension. *Clin. Pharmacol. Therap.* **14**:920, 1973.
- Strauss, H. C. and Bigger, J. T., Jr.
Electrophysiological properties of the rabbit sinoatrial perinodal fibers. *Circ. Res.* **31**:490-509, 1972.
- Strauss, H. C.; Saroff, A. L.; Bigger, J. T., Jr. and Giardina, E. G. V.
Premature atrial stimulation as a key to the understanding of sinoatrial conduction in man: Presentation of data and critical view of the literature. *Circulation* **47**:86-93, 1973.
- Ten Eick, R. E.; Bassett, A. L. and Okita, G. T.
Dissociation of electrophysiological and inotropic actions of strophanthidin-3-bromoacetate: Possible role of adenosine triphosphatase in the maintenance of the myocardial transmembrane Na^+ and K^+ gradients. *J. Pharmacol. & Exper. Therap.* **185**:12-23, 1973.
- Wang, H. H.; Liu, L. and Katz, R. L.
A comparison of the cardiovascular effects of sodium nitroprusside and trimethaphan. Program, Annual Meetings of the American Society of Anesthesiology, 1973, p. 223.
- Wang, Jack; Pierson, R. N., Jr. and Kelly, W. G.
A rapid method for the determination of deuterium oxide in urine: Application to the measurement of total body water. *J. Lab. & Clin. Med.* **82**:170-178, 1973.
- Weiss, R. M. and Holcomb, W.
Electrical stimulation of the *in vivo* canine ureter. *Fed. Proc.* **32**:390, 1973.
- Weld, R. M. and Bigger, J. T., Jr.
Effect of lidocaine on reactivation of the fast sodium-carrying system in cardiac Purkinje fibers. *Fed. Proc.* **32**:811, 1973.
Effect of lidocaine on kinetics of the fast sodium current in cardiac Purkinje fibers. *Circulation* **48** (IV):108, 1973.
- Wiggins, J. R. and Bassett, A. L.
Characteristics of KCl contracture in cat myocardium. *Physiologist* **16**:487, 1973.
- Wiggins, J. R.; Danilo, P., Jr.; Gelband, H. and Bassett, A. L.
Nicotine and potassium chloride contracture in mammalian ventricle. *J. Pharmacol. & Exper. Therap.* **185**:457-467, 1973.
- Wit, A. L.; Fenoglio, J. J.; Wagner, B. M. and Bassett, A. L.
Electrophysiological properties of cardiac muscle in the anterior mitral valve leaflet and adjacent atrium; possible implications for the genesis of atrial dysrhythmias. *Circ. Res.* **32**:731-745, 1973.
- Yeh, Billy K.
Localization of calcium antimonate in the atrial and ventricular muscle fibers of the cat heart. *J. Molec. & Cell. Cardiol.* **5**:351, 1973.

Physiology

JOHN V. TAGGART

Dalton Professor and Chairman of the Department

With the growing conviction that physiology of the central nervous system will be a major concern during the decades immediately ahead, the Department has been seeking means to enhance its teaching and research activities in this area. With the support of a grant from the Alfred P. Sloan Foundation, several visiting scientists concerned with molecular mechanisms of nerve cell membranes participated in lectures, seminars, and round-table discussions at the Medical Center; these included Dr. Marshall W. Nirenberg of the National Institutes of Health, Dr. Henry G. Mautner of Tufts University, and Dr. Eberhard Neumann of the Max Planck Institute at Goettingen.

During the past year, Dr. Denis Halmagyi, formerly of the University of Sydney, was appointed Associate Professor of Physiology (Surgery). Dr. Shunichi Usami was promoted to Senior Research Associate. Dr. Jorge Fischbarg was appointed Assistant Professor of Physiology (Ophthalmology), and Dr. Michel Ferin was appointed Assistant Professor of Physiology (Obstetrics and Gynecology).

Dr. Shu Chien was appointed to the editorial boards of the *American Journal of Physiology*, the *Journal of Applied Physiology*, *Biorheology*, *Circulatory Shock*, and *Microvascular Research* and was appointed to the Executive Committee of the European Society for Microcirculation. Dr. Arthur Karlin was appointed to the Board of Review of the *Federation Proceedings*, served as chairman of the Gordon Research Conference on Molecular Pharmacology, and was elected to membership in the Amer-

ican Society of Pharmacology and Experimental Therapeutics. Dr. John P. Reuben delivered a series of lectures on muscle at the Federal University of Rio de Janeiro. Dr. David Schachter was named Consultant in Physiology at St. Luke's Hospital Center. Dr. Fischbarg was elected to membership in the American Physiological Society and Dr. Ferin, to membership in the Endocrine Society.

Miss Inia Hikawj completed the requirements for the Ph.D. degree and was appointed Research Associate in the Department of Physiology at Louisiana State University at New Orleans. Ten other students are currently candidates for the Ph.D. degree. During the past year two visiting scientists, three post-doctoral fellows, and six medical and dental students participated in the Department's research activities.

Research Activities

Dr. Nastuk and his associates have continued to study neuromuscular transmission. Dr. Philip Su (Medicine, SUNY at Stony Brook) has begun a study of the effects of cortical steroids. Dr. J. F. Genaro, Jr., and Dorothy Rutherford, graduate student (Biology, New York University) are collaborating in a study of ultrastructural changes in nerve and muscle produced by methylene blue. Dr. David Devore, Postdoctoral Fellow, has begun a study of Ca uptake by pharmacologically desensitized muscle. Nuran Kumbarachi, graduate student, has begun a study of sarcomeric oscillation in skeletal muscle produced by caffeine. Craig Wolfson, graduate student in Biomedical Engineering, is continuing a

study of the effects of reduced temperature on receptor desensitization. Duncan Carpenter, undergraduate student from Bowdoin College, has studied the endplate distribution in skeletal muscle.

The Laboratory of Hemorheology under the direction of Dr. Shu Chien has continued work on the role of blood rheology in circulatory regulation. With the use of rotational viscometers, microfiltration, and microcinematography, Drs. Chien and Shunichi Usami have continued their analysis of the various factors regulating red cell deformability. The elastic properties of the red cell membrane are being modeled by Dr. Richard Skalak (Civil Engineering and Applied Mechanics, Morningside Heights Campus). Dr. Usami and Kung-ming Jan have used a light reflectometer to quantify the red cell aggregation induced by dextrans of various molecular weights and concentrations. Syngcuk Kim, dental student, is determining by microscopic observation and videotape recording the mechanical shearing force needed to disaggregate red cell rouleaux formed in various dextran fractions. Professor Ivan Popdimitrov, visiting scientist from the Higher Medical Institute in Varna, Bulgaria, is studying the effect of amino acid hydrolysates on red cell surface charge and deformability. Ronald Carlin, graduate student, has studied the partition of ^{133}Xe between red blood cells and plasma and is using the ^{133}Xe washout technique to measure coronary blood flow in the dog. Drs. J. Thomas Bigger, Jr. (Medicine, Pharmacology), Ronald E. Drusin (Medicine), and Mr. Allan M. Burke, medical student, have serially determined blood viscosity, blood volume, and cardiac output in patients following acute myocardial infarction. With Dr. John Laragh (Medicine) and his associates, blood rheological changes in hypertensive patients are being studied. Dr. Peter M. Scholz, visiting fellow (University of Basel), and Drs. John M. Kinney (Surgery) and Frank Gump (Surgery), are examining blood rheological data and hemodynamic measurements in acutely ill surgical patients. Drs. John F. Bertles (St. Luke's Hospital), Chien, and Usami have continued their investigations on the influence of oxygen saturation on blood viscosity in sickle cell anemia. The laboratory is participating in the Harlem Hospital-Columbia Comprehensive Sickle Cell Center with Dr. Jeanne A. Smith in studying blood viscosity changes in sickle cell crisis.

Dr. David Schachter and Szloma Kowarski, continuing their studies on the absorption of minerals in the small intestine, have shown that vitamin D regulates calcium absorption by controlling the synthesis or maintenance of essential protein compo-

nents and that a soluble Ca-binding protein and divalent cation-dependent ATPases are implicated. The existence of a family of divalent cation secretory mechanisms in the small intestine has been demonstrated by Dr. Carolyn Stanek, Postdoctoral Fellow, who is studying zinc secretion, and Dr. Matthew Guy, Postdoctoral Fellow, who is investigating iron secretion. Dr. Ellen Batt is investigating the mechanism of glucose transport across human erythrocytes. Laura Schlessinger, graduate student, has completed a study of insulin regulation of hexose transport across isolated rat adipocytes. Dr. Richard E. Abbott, Research Associate, is synthesizing reagents for selective labeling and the isolation of cell membrane proteins, particularly those of the human erythrocyte.

Drs. Louis J. Cizek and Mero R. Nocenti have demonstrated that estrogen inhibits water intake in the food-deprived, polyuric-polydipsic rabbit. More direct neurophysiological evidence of this action is being sought with the collaboration of Dr. Raimond Emmers. They have initiated studies on the changes in plasma volume and the renin-angiotensin system during the natriuretic-polyuric-polydipsic syndrome accompanying caloric deprivation. Esther Ho Kung, medical student, found that the above syndrome is also induced by partial reductions in caloric intake. Andrew La Barbera, graduate student, and Thomas J. Castellano, medical student, have initiated studies on the effects of pituitary hormones on ovarian steroidogenesis. Irene Hikawyj, graduate student, has completed her research project on the inhibitory effects of adrenal steroids on protein metabolism in connective tissue.

Dr. Emmers has continued work on the neural control of food intake and has shown with recordings from single neurons in the cat hypothalamus that the activity of the cells which control food intake is governed by the gustatory system. Dr. Valentin Corpus found that stimulation of the cat tongue with solutions of quinine or acetic acid alters the activity level of the hypothalamic food intake control neurons and that the same effect was obtained when these solutions were infused intravascularly. Gerardo Bilotto, graduate student, used a behavioral method to determine the influence of the thalamic taste nucleus on food intake in albino rats. Marvin I. Ruderman, medical student, worked on electrically induced analgesia in rats. The possibility of inducing conditioned responses in cats under general anesthesia is being explored by Sima Mraovitch, graduate student, who hopes to utilize such a method of conditioning to study the significance of sensory modality codes within the somatosensory thalamus.

Drs. Martin Blank and John S. Britten have con-

tinued work on various problems related to the properties of membranes. Dr. Lily Soo is examining the contact of sperm cells with electrode surfaces and Mrs. Beatrice Lee has continued experiments on the surface properties of protein films.

Drs. Arthur Karlin, David A. Cowburn, and Mark G. McNamee (Neurology) have continued the chemical and physical characterization of the acetylcholine receptor in membrane vesicles and in a solubilized, purified state. Allen Hirsh, graduate student, has investigated the voltage and ionic dependencies of the acetylcholine receptor in the electroplax.

Drs. Paul Witkovsky and F. E. Dudek, Postdoctoral Fellow (Ophthalmology), are examining the spectral and adaptational properties of carp photoreceptors. Physiological and anatomical studies on photoreceptors of tadpole eye rudiments grown in culture were examined with Dr. J. Hollyfield.

Dr. John P. Reuben (Neurology) and his associates have continued to study the regulation of the interaction between actin and myosin in skinned muscle fibers, the roles of MgATP and Ca in extracted myofibrils, and the electrical and physical properties of the transverse tubular system of muscle.

Dr. Michel Ferin (Obstetrics and Gynecology) is locating in the rhesus monkey the sites in the central nervous system which are responsible for steroid control of gonadotropin secretion and is examining the sensitivity of the pituitary to short- and long-term

stimulation by the synthetic decapeptide LRH.

Dr. Denis Halmagyi (Surgery) is developing methods for measuring lung volume, lung mechanics, and the pulmonary elimination of foreign inert gases in surgical patients.

Dr. Jorge Fischbarg and Dr. Jong J. Lim, Postdoctoral Fellow (Ophthalmology), are attempting to elucidate the detailed mechanism by which the corneal endothelium transports relatively large amounts of fluid and develops a small electrical potential. With Drs. Ethel Anderson and Abraham Spector, the influence of several nutrients on transport-related biochemical parameters of the endothelial cells is being studied.

Donors

The Department acknowledges with gratitude the support received from the following sources: American Heart Association, Coffey Research Gift, Department of Defense, Fight for Sight, Magnus and Georgianne Gregersen Fund, Heart and Lung Foundation, Irma T. Hirsch Trust, Maxwell Upson Foundation, Merck Sharp and Dohme, National Science Foundation, National Institutes of Health, New York Diabetes Association, New York Heart Association, Mrs. George W. Perkins, Population Council of New York, Scaife Family Charitable Trust, Smith Kline and French Foundation, Sickie Cell Disease Center grant, Alfred P. Sloan Foundation, and anonymous donors.

1973 Publications

Physiology

Abbott, R. E. and Schachter, D.

Dextran-maleimide: An oriented probe of membrane structure and function. *J. Clin. Invest.* **52**:1a, 1973.

Anderson, E. I.; Fischbarg, J. and Spector, A.

Fluid transport, ATP level and ATPase activities in isolated rabbit corneal endothelium. *Biochim et Biophys. Acta*, **307**:557-562, 1973.

Bach, D.; Britten, J. S. and Blank, M.

Polarographic studies of membrane particles containing Na-K ATPase. *J. Membrane Biol.* **11**:227, 1973.

Batt, E. R. and Schachter, D.

Transport of monosaccharides. I. Asymmetry in the human erythrocyte mechanism. *J. Clin. Invest.* **52**:1686, 1973.

Benis, A. M.; Chien, S.; Usami, S. and Jan, K.-M.

Inertial pressure losses in perfused hindlimb: A re-interpretation of the results of Whittaker and Winton. *J. Appl. Physiol.* **34**:383-389, 1973.

Blank, M.

The oxygenation of hemoglobin as a problem in surface chemistry. *J. Colloid & Interface Sc.* **43**:557, 1973.

Blank, M. and Britten, J. S.

Comments on the molecular basis of fluidity in membranes. *Chem. & Physics Lipids.* **10**:286, 1973.

Blank, M.; Lee, B. B. and Britten, J. S.

The effects of cations on the yield distress of ovalbumin monolayers. *J. Colloid & Interface Sc.* **43**:539, 1973.

Britten, J. S. and Blank, M.

Effects of cations on biologically active surfaces—Specific binding sites in the Na-K ATPase. *J. Colloid & Interface Sc.* **43**:564, 1973.

Brookes, N.; Blank, M. and Werman, R.

The kinetics of the conductance increase produced by GABA at the membrane of locust muscle fibers. *Molec. Pharmacol.* **9**:580, 1973.

- Carlin, R. and Chien, S.
Distribution of ^{133}Xe between erythrocytes and plasma. *Physiologist* 16:279, 1973.
- Chien, S.
Electrochemical and ultrastructural aspects of red cell aggregation. *Bibliotheca Anat.* 11:244-250, 1973.
Force balance at the surfaces of aggregating cells. *Bibliotheca Anat.* 11:303-309, 1973.
- Chien, S. and Jan, K.-M.
Ultrastructural basis of the mechanism of rouleaux formation. *Microvasc. Res.* 5:155-166, 1973.
Red cell aggregation by macromolecules: Roles of surface adsorption and electrostatic repulsion. *J. Supramolec. Struct.* 1:385-409, 1973.
- Chien, S.; Jan, K.-M. and Usami, S.
Interactions of mechanical and electrochemical forces in red cell aggregation. *Microvasc. Res.* 6:120, 1973.
- Chien, S.; Usami, S.; Dellenback, R. J. and Magazinic, V.
Blood rheology after hemorrhage and endotoxin. In: *Neurohumoral and Metabolic Aspects of Injury*, vol. 33. A. G. B. Kovach, H. B. Stoner, and John J. Spitzer, eds. Plenum Publishing Corp., New York, 1973, pp. 75-93.
- Chien, S.; Usami, S.; Jan, K.-M. and Dellenback, R. J.
Comparative pathophysiology of hemorrhagic shock in monkeys and dogs. *Fed. Proc.* 32:357, 1973.
- Chien, S.; Usami, S.; Jan, K.-M. and Skalak, R.
Macrorheological and microrheological correlation of blood flow in the macrocirculation and microcirculation. In: *Rheology of Biological Systems*. H. L. Gabelnick and M. Litt, eds. Charles C. Thomas, Springfield, Ill., 1973, chap. 2, pp. 12-48.
- Cizek, L. J.; Provine, M.; Icenhower, W. and Nocenti, M. R.
Inhibition by estrogen of the polyuric-polydipsic syndrome in the hypophysectomized, food-deprived male rabbit. *Proc. Pennsylvania Acad. Sc.* 46:61-62, 1972.
- Dyrenfurth, I.; Jewelewicz, R.; Warren, M.; Ferin, M. and Vande Wiele, R. L.
Temporal relationship of hormonal variables in the menstrual cycle. In: *Biorhythms and Human Reproduction*. Wiley Interscience, New York, 1973.
- Eastwood, A. B. III and Reuben, J. P.
Modification of E-C coupling by D_2O . *J. Gen. Physiol.* 61:246, 1973.
- Eastwood, A. B. III.; Zollmann, J.; Katz, George and Reuben, J. P.
Disruption of the TTS in crayfish muscle fibers. *Fed. Proc.* 32:876, 1973.
- Edelson, A. M. and Nastuk, W. L.
Pre and postjunctional effects of 1-fluoro-2, 4 dinitrobenzene at the frog neuromuscular junction. *J. Physiol.* 229:617-633, 1973.
- Emmers, R.
Interaction of neural systems which control body water. *Brain Res.* 49:323-347, 1973.
The use of digital computers in the analysis of certain neural feedback control functions. *Electrochem. Soc. Ext. Abst.* 73:496-497, 1973.
- Existence of a negative feedback loop between two hypothalamic systems which separately control feeding and satiety. *Physiologist* 16:305, 1973.
- Emmers, R. and Ruderman, M. I.
Inhibition of afferent transmission via the T-cells of the rat spinal cord. *Anat. Rec.* 175:314, 1973.
- Emmers, R. and Sekaer, C.
Sensory coding at the 2nd order neurons of lingual afferents in the cat lower brain stem. *Fed. Proc.* 32:340, 1973.
- Ferin, M.; Halberg, F.; Richart, R. M. and Vande Wiele, R. L., editors
Biorhythms and Human Reproduction. Wiley Interscience, New York, 1973.
- Ferin, M.; Khalaf, S.; Warren, M.; Dyrenfurth, I.; Jewelewicz, R.; White, W. and Vande Wiele, R. L.
Effects of continuous infusions of synthetic LH-releasing hormone (LRH) in Rhesus monkeys. Endocrine Society Meeting, Chicago, Ill., June 1973 (abstract).
- Fischbarg, J.
Active and passive properties of the rabbit corneal endothelium. In: *Proceedings of the International Symposium on Transport in the Eye*, J. A. Zadunaisky, ed. *Exp. Eye Res.* 15:615-638, 1973.
- Fischbarg, J. and Lim, J. J.
Determination of the impedance locus of rabbit corneal endothelium. *Biophys. J.* 13:595-599, 1973.
- Halmagyi, D. F. J.; Frazer, T. A. and Varga, D.
Treatment of volume resistant experimental shock by hypervolemia and hypothermia. *Surgery* 74:370-380, 1973.
- Hikawij, I. and Nocenti, M. R.
The *in vitro* influence of steroidal hormones on ^{14}C -glycine incorporation in isolated granulomatous cells. *Fed. Proc.* 32:752, 1973.
- Jan, K.-M. and Chien, S.
Role of surface electric charge in red blood cell interactions. *J. Gen. Physiol.* 61:638-654, 1973.
Influence of ionic composition of fluid medium on red cell aggregation. *J. Gen. Physiol.* 61:655-668, 1973.
Role of the electrostatic repulsive force in red cell interactions. *Bibliotheca Anat.* 11:281-288, 1973.
- Karlin, A.
Molecular interactions of the acetylcholine receptor. ASPET Symposium on Membranes and Mechanisms of Hormone Action. *Fed. Proc.* 32:1847-1853, 1973.
Molecular aspects of the acetylcholine receptor. In: *Fifth International Congress on Pharmacology, Symposium on Cholinergic Receptor Mechanisms*. Basel, S. Karger, 5:86-97, 1973.
- Kowarski, S.; Blair-Stanek, C. S. and Schachter, D.
Active transport of zinc by rat jejunum and its association with a zinc-binding protein. *Gastroenterology* 64:A-176, 1973.
- Nastuk, W. L.
Some basic factors involved in the production of neuromuscular block by various quaternary ammo-

- mium compounds. In: *Endocrines and Enzymes in Anesthesiology*. C. M. Ballinger and V. Brechner, eds. Charles C. Thomas, Springfield, Ill., 1973.
- Nastuk, W. L. and Alexander, J. T.
Non-homogeneous electrical activity in single muscle fibers. *Fed. Proc.* **32**:333, 1973.
- Nastuk, W. L.; Gissen, A. J. and Karis, J. H.
Some factors involved in the use of certain pharmacological agents in the treatment of myasthenia gravis. In: *Endocrines and Enzymes in Anesthesiology*. C. M. Ballinger and V. Brechner, eds. Charles C. Thomas, Springfield, Ill., 1973.
- Nocenti, M. R. and Cizek, L. J.
Influence of estrogen on renal function and water intake in male rabbits rendered polyuric-polydipsic by food deprivation. *Endocrinology* **93**:925-931, 1973.
- Prives, J. M.; Reiter, M. J.; Cowburn, D. A. and Karlin, A.
Interactions of a cobra neurotoxin and affinity labels of the acetylcholine receptor in the electroplax. *Molec. Pharmacol.* **8**:786-789, 1972.
- Ruiz-Manresa, F. and Grundfest, H.
Ionic pharmacology of the electrically excitable potassium conductance system (g_K) of eel electroplaques. *J. Gen. Physiol.* **61**:268, 1973.
- Schlessinger, L. and Schachter, D.
Direct estimation of 3-O-methylglucose transport by isolated rat adipocytes: Effects of insulin. *Fed. Proc.* **32** (Part 1):119, 1973.
- Seaman, G. V. F. and Chien, S.
First International Congress of Biorheology. Meeting reports. *Fed. Proc.* **32**:1645-1646, 1973.
- Skalak, R.; Tozeren, R.; Zarda, R. P. and Chien, S.
Strain energy function of red blood cell membranes. *Biophys. J.* **13**:245-264, 1973.
- Sorenson, M. M.; Dawson, M. J.; Reuben, J. P. and Brandt, P. W.
Modes of action of anions which attenuate tensions in skinned muscle fibers of the crayfish. 17th Ann. Mtg. Biophysical Society, 1973, p. 182a.
- Stell, W. K. and Witkovsky, P.
Retinal structure in the smooth dogfish, *Mustelus canis*: General description and light microscopy of giant ganglion cells. *J. Comp. Neurol.* **148**:1-32, 1973.
Retinal structure in the smooth dogfish, *Mustelus canis*: Light microscopy of photoreceptors and horizontal cells. *J. Comp. Neurol.* **148**:33-46, 1973.
- Sweeney, G. D. and Blank, M.
Some electrical properties of thin lipid films formed from cholesterol and cetyltrimethylammonium bromide. *J. Colloid & Interface Sc.* **42**:410, 1973.
- Witkovsky, P.; Nelson, J. and Ripps, H.
Action spectra and adaptation properties of carp photoreceptors. *J. Gen. Physiol.* **61**:401-423, 1973.
- Witkovsky, P. and Stell, W. K.
Retinal structure in the smooth dogfish, *Mustelus canis*: Light microscopy of bipolar cells. *J. Comp. Neurol.* **148**:47-60, 1973.
Retinal structure in the smooth dogfish, *Mustelus canis*: Electron microscopy of serially sectioned bipolar cell synaptic terminals. *J. Comp. Neurol.* **150**:147-168, 1973.
- Witkovsky, P.; Zeigler, H. P. and Silver, R.
The nucleus basalis of the pigeon: A single unit analysis. *J. Comp. Neurol.* **147**:119-128, 1973.
- Zimmerman, E. A.; Carmen, P. W.; Husain, M. K.; Ferin, M.; Frantz, A. G. and Robinson, A. G.
Secretion of neurophysin and vasopressin in hypophyseal portal blood in monkeys. Endocrine Society Meeting, Chicago, Ill., 1973 (abstract).

Psychiatry

LAWRENCE C. KOLB

Professor and Chairman of the Department • Director of Service

During the past year, Dr. Sidney Malitz, Professor of Clinical Psychiatry, was appointed Vice Chairman of the Department and Dr. Lothar Gidro-Frank was appointed Clinical Director of the New York State Psychiatric Institute, succeeding Dr. Phillip Polatin, Professor Emeritus.

The Department was fortunate in recruiting Dr. Jerome Jaffe as Professor on his resignation from his posts as Director of the Special Action Office for Drug Abuse Prevention, Executive Office of the President, and Special Consultant to the President for Narcotics and Dangerous Drugs. Dr. Jaffe has attained international distinction for his research work on narcotic addiction and drug abuse. Here he will also assume the post of Chief of the Department of Biological Psychiatry in the Psychiatric Institute. We are also pleased to welcome to the faculty Dr. Otto Kernberg as Professor of Clinical Psychiatry. Formerly Director of the C. F. Menninger Memorial Hospital, Dr. Kernberg has gained wide acclaim for studies of the borderline schizophrenic states. In the Psychiatric Institute he will direct the General Clinical Service, which has for some years been concerned with understanding and treating the young schizophrenic reactions.

Dr. Irving Kupfermann joined the staff of the New York State Psychiatric Institute as an Associate Research Scientist in the Department of Behavioral Physiology, headed by Dr. Murray Glusman. Dr. Kupfermann, who has a Ph.D. in Biopsychology from the University of Chicago, has been closely associated with Dr. Eric Kandel at the New York

University School of Medicine, where he has held a combined appointment as Associate Professor in the Departments of Physiology and Psychiatry. Dr. Kupfermann will similarly have a joint appointment as Associate Professor of Medical Psychology in the Department of Psychiatry and as Associate Professor of Physiology under Dr. Taggart in the Department of Physiology. Dr. Kupfermann's appointment is part of the planned transfer of Drs. Eric Kandel, Alden Spencer, and their associates from New York University to the Columbia Medical Center; it reflects the increased interest at Columbia in strengthening teaching and research in the neurosciences.

The faculty was saddened by the death of Dr. Sandor Rado on May 14, 1972. Dr. Rado retired as the first Director of the Columbia Psychoanalytic Clinic, having served throughout the initial decade of life of the first university medical center psychoanalytic institute. The Department also regrets deeply the death of Dr. George Gold, Assistant Clinical Professor, who taught for many years in the Postgraduate Course in Psychiatry and Neurology.

The Department regrets the resignation of Mrs. Violet Cherry, Chief Psychiatric Social Worker in the Vanderbilt Clinic, who made many valuable contributions in the development and organization of the Psychiatric Social Service in the Clinic, and those of Mrs. Judith Levitan and Miss Marta Ochoa, both of whom were valuable members of our Psychiatry Clinic Social Service Team. Mrs. Sylvia Rosenberg joined the Vanderbilt Clinic staff as Chief of our Psychiatric Social Work.

We regret the resignations of Dr. Charles Avery, Assistant Psychiatrist and Dr. Theodore Meltzer, Assistant Psychiatrist, from the Vanderbilt Clinic staff.

During May, Dr. Lawrence Kolb served as Visiting Professor in Psychiatry under the auspices of the South African Foundation for the Study of Psychoanalysis at the Universities of Capetown, Witwatersand, and Natal. He also gave clinical seminars at the Universities of Stellenbosch and Pretoria. Professor Leo Srole was recently appointed consultant to the Belgian Minister of Health and member of the Advisory Board of the Institute for European Health Services Research. Dr. Richard Druss received the Annual Merit Award of the Association for Psychoanalytic Medicine.

Teaching

There were few changes in the curricula of the various teaching divisions during the year. In preparation for the coming increase in the size of the medical school class, the Department is making increased use of faculty and clinical facilities at the affiliated hospitals. Some students are assigned for their clinical experiences to Harlem Hospital, where they work with Dr. Bruce Ballard; to Roosevelt Hospital, where they work with Dr. Steven Katz; and St. Luke's, where they work with Dr. Eugene Feigelson. In addition, some students obtain experience with inpatients at Meyer-Manhattan Hospital under the supervision of Dr. Anthony Arce.

Dr. James Ryan and colleagues in the Educational Research Laboratory in the Psychiatric Institute distributed 10 chapters of the televised *Electronic Textbook of Psychiatry* to 18 medical school departments of psychiatry in this country and one in Australia.

A course in Child Development and Child Therapy has been instituted for second-year General Psychiatry residents. During the past year, the Psychoanalytic Clinic formally began its elective training in child analysis. Seven candidates entered this program.

The training program expansion of the Division of Community and Social Psychiatry to include non-physician trainees as candidates for the Master's degree continued, and seven such trainees entered the program in September 1973. In an effort to further develop new models of training for new types of mental health professionals, the Division, under a grant from the vanAmeringen Foundation with Sonia Charif, M.S.W., serving as Special Project Coordinator, collaborated with community colleges in the New York area in; (1) study and evaluation of

curriculum and job performance expectations for students enrolled in two-year community college training programs leading to an A.A. or A.S. degree in mental health, and students enrolled in a four-year college mental health training program leading to a B.A. or B.S.; (2) study and development of curriculum and job performance expectations for Master's degree candidates in the Community Mental Health training program of the Division who are recruited from other than traditional mental health disciplines; (3) study and development of an integrated, inter- and intrainstitutional system whereby the three two-year segments of training could be progressively accepted by the higher level institutions with appropriate recognition given both to the quality of the training received and the academic credit earned.

Research

In the *Presbyterian Hospital*, Dr. Bruce Forester initiated a study of the emotional responses of patients to radiotherapy. His research is designed to determine the nature and extent of psychiatric morbidity during and immediately after the experience, as well as the effects of these reactions to modifications in radiotherapy setting and of psychotherapy provided during the radiotherapy treatment period. The N.I.M.H. extended its support for three more years to the research of Drs. D. Kornfeld, S. Heller, and K. Frank on psychiatric aspects of coronary artery revascularization. Dr. M. Viederman is involved in research on adaptation to renal dialysis, renal transplants, and attitudes toward death; Dr. D. Iverson is investigating the sexual difficulties related to spinal injuries and depression. Dr. R. Druss continues, with the Plastic Surgery Service, work on patients undergoing cosmetic surgery at the Presbyterian Hospital representing an ongoing interest in body image phenomena.

In the Division of *Child Psychiatry*, Drs. H. Donald Dunton, Joseph A. Silverman (Pediatrics), and Raymond L. Vande Wiele (Obstetrics and Gynecology) began a clinical study of ballerinas for comparison with anorexia nervosa patients. Drs. Leah Beck and John K. Lattimer (Urology) are studying the sexual functioning of adults who have had hypospadias repair in childhood. Also with Mrs. Evelyn Heimlich, paraverbal therapist, and Mrs. Esther Brown, psychiatric social worker, they are involved in a study to improve the quality of life of post-operative depressed children who have damaged images as a result of urological surgery. Drs. Mary MacKay and Robert Parkin are studying treatment approaches to dysfunctional children in dysfunc-

tional families. With Dr. Arthur Carr, Dr. MacKay is involved as well in a study of the relationship of mixed laterality to the establishment of visual or auditory orientation and the subsequent personality development.

A new interview schedule was developed by the *Social Psychiatry Research Unit* to examine changing relationships over time among commonly occurring stressful life events, psychiatric symptomatology, and ability and disability in role functioning. The schedule is being tested in preliminary trials with a small sample of adult respondents drawn on a probability basis from contrasting class and ethnic groups in New York City. Collaborating with Bruce P. Dohrenwend, Ph.D., in this research are Drs. Barbara S. Dohrenwend, Gladys Egri, Frederick Mendelsohn, Thomas Yager, Mr. Gerald Adler, and Miss Diana Cook, all members of the Unit.

Dr. Norman Lazar, of the *Columbia University Psychoanalytic Clinic*, directed by Dr. Aaron Karush, published a report on ongoing studies describing the changing problems of patients seeking psychoanalytic therapy. Drs. Arnold Cooper, Gerald Fogel, and Larry Shaderowsky began a study of the specific effects upon the analytic process created by the live presentation of patients in analytic treatment before students of the Clinic. Dr. Lionel Ovesey and Ethel Person published a report of their studies on transsexualism.

At the *Psychiatric Institute*, Dr. Julien Mendlewicz, working with Drs. John Rainer and Ronald Fieve, reported on the genetic risk for manic depressive psychosis in first-degree relatives of patients studied in the Lithium Clinic. The risk for parents, brothers and sisters, and children of bipolar (manic-depressive) patients is greatly increased over general population rates, with both bipolar illness and unipolar illness (recurrent depression) found in the relatives. The degree of risk and the sex distribution of the affected relatives, as well as computer analysis of all the data, fit best an X-linked dominant transmission, though it is clear that there must be some heterogeneity in the total genetic picture. These results parallel the linkage studies with color blindness and Xga blood group previously reported by this team and further substantiated during the current year by the inclusion of new informative families. With Dr. Fieve and Dr. F. Stallone, Dr. Mendlewicz reported that striking differences were found in the genetic backgrounds of lithium responders and failures: response to lithium treatment was significantly associated with the presence of manic-depressive illness in the patients' families.

Dr. L. Erlenmeyer-Kimling, working with Dr. Rainer and Ms. Robin Wunsch, completed the first stage of the prospective study of children of schizophrenic parents. In the special laboratory set up for this project, 205 children so far underwent neurological examinations, psychological and psychophysiological tests, and psychiatric interviews (including parents). Analysis of the data, suggests certain differences between children of schizophrenic parents and controls. In the descriptive area, these include a greater likelihood of sensory defects, eating problems, temper tantrums, and low frustration tolerance. Performance on the Bender-Gestalt test is worse. There is a trend toward certain positive neurological signs, and psychophysiological tests point to some possible difficulties in relation to attention and stimulus input. The ultimate goals of this research, are to develop methods of screening children at risk for schizophrenia, and to base preventive programs on the increased understanding of etiology and the pre-morbid state that prospective studies are expected to contribute.

Drs. Kenneth Altshuler and Rainer completed a cross-cultural study of impulsivity in deaf persons, using populations from the United States and Yugoslavia. In both countries, deaf adolescents who were tested showed higher indicators of impulsivity than their hearing counterparts. The Yugoslavians of both groups showed higher scores for impulsivity than the Americans but maintained the same differences between the deaf and hearing samples.

Drs. Ronald Fieve and Herbert Meltzer discovered in their continuing research with rubidium salts that in three depressed patients, total doses of from 363 to 429 mEq with plasma levels in the range of 0.3 to 0.4 MEq/per liter were achieved. Total body potassium studies at the Nuclear Medicine Unit at St. Luke's Hospital, with the collaboration of Dr. Richard N. Pierson, disclosed that the replacement of potassium by rubidium did not exceed 12 per cent in any of the rubidium-loaded patients. Since severe toxicity in several animal species does not occur until potassium replacement by rubidium exceeds 40 per cent these human measurements provide assurance of the medical safety of the rubidium protocol. By intensive study of rubidium-potassium excretion patterns in depressed patients, who were receiving medication other than rubidium, Drs. Meltzer and Fieve observed that lithium is one of the very few substances capable of increasing the ratio of rubidium to potassium excreted in the urine. These results suggest that lithium limits intracellular accumulation of rubidium. As toxicity is associated

with excessive intracellular rubidium, the hypothesis currently being tested is that lithium might prevent rubidium toxicity.

Under the direction of Dr. Morton Levitt, a new nonradioactive assay was developed to measure DBH activity in human plasma. The primary project has been to measure enzyme activity in plasma of Lithium Clinic outpatients as well as in the families of these patients.

Drs. Levitt and Fieve began a study of monoamine oxidase activity in human blood platelets. This enzyme will also be assessed in the Lithium Clinic population and in the families of manic-depressive patients, particularly those in whom x-linkage has been demonstrated.

Dr. David Dunner continued investigations on biogenic amine metabolism in depressed patients. The clinical and pharmacological effects of L-dopa and L-tryptophan were assessed by double-blind administration of these biogenic amine precursors to inpatients on the 4 North Metabolic Unit.

Dr. W. C. Clark with Mr. Lewis Mehl and Dr. Yang (Anesthesiology) has been studying the effect of acupuncture on perception of noxious thermal stimulation (experimental pain). The decrease in pain responses to such stimulation found in the arm treated with acupuncture suggested that effective analgesia had been induced. Sensory decision theory analysis of the data, however, revealed that the change was in the response criterion for pain rather than in pain sensitivity as such. This failure to find a sensory (physiological) change suggested that analgesia actually had not been induced because physiological analgesia would be expected to attenuate neural input and thus reduce sensory sensitivity to pain. The major effect of the acupuncture procedure appeared to be to cause the subjects to elevate their criterion for reporting pain, perhaps in response to expectancies as to the effect of acupuncture.

Drs. Michael Aronoff and H. F. Hunt completed a pilot study on factors influencing self-regulated morphine intake by a relapsed narcotic addict inpatient. Three such cases were reported previously in the scientific literature. In each earlier case, the addict increased his drug intake progressively up to the time scheduled for arbitrary and complete withdrawal. In contrast, the addict studied here limited his intake and then switched to progressively decreasing doses of methadone to become detoxified and narcotic-free well prior to the arbitrarily designated cut-off date, apparently as a function of various psychosocial and behavioral supports incorporated into the inpatient situation. Progressive increases in

narcotic intake by relapsed addicts are probably less inevitable than is commonly considered to be the case. Detailed personality and follow-up studies are in progress to determine what factors in the subject's life situation and in the experimental setting could be responsible for this favorable outcome.

Dr. Leo Srole reported that the N.I.M.H. awarded a four-year grant to conduct a 20-year follow-up investigation of the Midtown Manhattan Study sample studied in 1953-1954. Three-hour reinterviews with some 700 of the original respondents began. With coverage of a large series of current life outcomes, including somatic morbidity, psychopathology (manic-depression disorders in particular), anomia, microsuicidal behaviors, goal achievement-deprivation, etc., a search will be made of their predictors in the 1953 base line information. The hope is that such predictors will enlarge the sociological foundations for preventive psychiatry. Dr. Srole and his colleagues completed field work for the Geel (Belgium) Foster Family Care Research Project in November 1973. On the basis of earlier findings, Dr. Srole made the first of a series of recommendations to the Belgian Minister of Health for operational changes in the Geel program. Implementation of these recommended changes was phased in, beginning March 1973. Further recommendations for the next five years are being formulated.

The study of social networks in New York, London and Vermont initiated by Dr. Muriel Hammer of the Biometrics Research Unit developed along two lines: (1) networks based on close friendship patterns, and (2) networks based on common meeting grounds such as churches or coffee shops. A further distinction was made in each of these networks between the personal network of each member and the overall network in which he constituted an element. An analysis of the personal networks indicated that for all, same-sex choice of friends predominates, especially for non-kin relationships. In kin choices, the London network chose women more often than men, the Vermont network chose men more often than women, and the New York network was somewhere in between. It is planned to examine the networks of the mentally ill population to determine the type of interrelatedness they exhibit and whether the patterns observed in the general population also hold for the patients with psychopathology of various categories.

Dr. Barry Gurland received a grant for four years to conduct a population study of the mental health of an aged population (over 65) in New York and London. In a previous study of hospitalized aged

individuals, the large discrepancies between London and New York hospitals in the proportions of organic (dementing) and functional (depressive and schizophrenic) were found to reflect differences in psychiatric styles of diagnosis rather than clinical differences in the patients.

Drs. Robert L. Spitzer and Jean Endicott, with the assistance of Paul Redlin and Henrietta Wolland of the Psychiatric Institute Computer Center, completed two studies of the value to the clinician of automated psychiatric diagnoses based upon clinical ratings of symptomatology. The results indicated that many clinicians find the computerized output helpful in differential diagnosis and that, to some degree, the computer can simulate the diagnostic practices of an outside consultant.

Dr. Robert Spitzer and his staff continued their collaboration with Dr. Marvin Herz, Director, Washington Heights Community Service. A controlled study of the efficacy of individual versus group therapy in the outpatient department of this service was undertaken. Although there were no significant differences in the measures of efficacy applied, group therapy was generally regarded as more efficacious because of the greater opportunity for patient socialization offered by this method. Diagno III—a new computer program for multiple psychiatric diagnosis, which uses information from the Mental Status Examination Record and the Psychiatric Anamnestic Record—was field-tested. The results indicated good agreement between the computer diagnosis and that of an expert clinician.

Dr. Denis Kandel continued studies of the relative influences of peers versus parents on drug use in high school students. The preliminary findings indicate that contrary to popular belief, parents' use of psychoactive drugs bears little relation to adolescent marihuana use but peer use of drugs is influential.

In Dr. Samuel Sutton's investigation of the reaction time to a monaural single click versus a double click separated by variable intervals, the double click reduced the reaction time of the patients more than of normals. This unexpected difference in favor of the patients is free of the usual confounding effects of lack of motivation or attention attributed to patients since the patients performed better than normals. The results are being examined against the background of the various profiles by psychopathology exhibited by the patients. Also Dr. Sutton found that the evoked potentials of schizophrenics when contrasted with those of depressives and normals stand out in such sharp relief that even naive subjects without any prior exposure to work in

evoked potentials discriminated the schizophrenic records in a matched sorting test with a high degree of reliability. Similarly, his vision laboratory found that schizophrenics characterized by thought disorder have shorter critical durations of temporal integration (integrate less stimulus energy over time) than other patients or normals. This enables schizophrenics to discriminate brief stimuli, based on reaction time, which the normal can not discriminate.

Drs. Murray Glusman, George Dauth and Cornelis Stokman have been pursuing their studies of the role of biogenic amines in agonistic behavior. Their investigations involve pharmacological manipulation of the brain levels of dopamine, norepinephrine, serotonin, and related substances, and examining the effects of these manipulations on the behavior of cats with and without brain lesions. Dr. Dennis Kelly and Miss Nancy Oley completed their study of the behavioral syndrome characterized by tameness and affectionate behavior which appears in cats following lesions of the septal forebrain. Dr. Potegal has been studying aggressive behavior in rats. His current work includes an investigation of dishabituation and displacement activity effects in predatory killing by hooded rats. Dr. Kupfermann has been carrying out a behavioral and neurophysiological analysis of feeding behavior in the marine mollusc *Aplysia*. His work involves intracellular electrical recordings from the nerve cells that control feeding in order to delineate the neuronal circuitry involved in feeding and to determine the functions of the various neural components.

Dr. M. M. Rapport and his associates, Drs. L. Graf and A. Kisc, continued studies of the immunochemistry of membranes of brain, blood, and gastrointestinal tissue cells. They isolated and determined the chemical composition of cytolipin S and cytolipin G. Dr. S. Mahadik, L. Graf, M. M. Rapport, and Mrs. Laev made good progress in their efforts to study brain development by following the appearance of specific brain proteins using immunochemical techniques. In addition to S-100 and neurostenin, they isolated new proteins, prepared antisera to them, and are now studying development of rat brain by immunofluorescence. Drs. A. Barkai, S. Mahadik, and M. M. Rapport developed a method for determining the rate of incorporation of glucose carbon from an intravenously administered trace amount into protein and lipid end products in brain. They established that food deprivation for 72 hours alters the rate of such incorporation into soluble proteins without affecting the rate for structural proteins or complex lipids. These studies should provide

a valuable index of nutritional and drug perturbations of brain metabolism. Dr. H. Tamir continued studies of the cytoplasmic protein with high binding affinity for serotonin by determining its distribution in brain regions, the effect of brain lesions, and various methods of increasing its purity. Drs. B. Weiss and R. Stiller prepared two 2-amino-1,3,4,5-tetrahydroxy octadecanes which they plan to test for antimetabolite activity. Drs. G. Alexander and H. Meltzer studied the effects of rubidium salts in animals. They observed that moderate doses increased the toxicity of p-chlorophenylalanine for rats, whereas the seizure-potentiating effects of this drug were eliminated. Susceptibility to audiogenic seizures was induced in rats receiving a high level of rubidium salts in this diet.

Drs. L. Roizin and N. Willson and J. C. Liu, M.S., with Dr. J. Schneider and C. Mullen, M.S. of the New York State Research Institute for Mental Retardation, Staten Island, N.Y., in investigations on the prolonged effects of LSD-25 administration upon neurons of cord ganglia tissue cultures, observed by electron microscope qualitative and quantitative changes of the intraneuronal organelles, particularly their unit membranes.

Drs. L. Roizin, M. Kaufman, N. Willson, and S. Hashimoto, and J. C. Liu, M.S., and B. Eisenberg-Gelber, B.A., with Drs. M. Helpner and M. Baden of the Chief Medical Examiner's Office, New York City, continue to study pathogenic mechanisms in the drug addiction syndromes. On the basis of a multidisciplinary methodology they suggested that the pathogenesis of the human reversible and adverse irreversible reactions results from the compound effects of the interaction of the histochemical correlates of the central nervous system and liver with the pharmacodynamic properties of the chemical agents and the participation of accessory factors, (medical, behavioral, including emotional and mental stress, nutritional, environmental, socioecological and economic). Drs. L. Roizin, S. Hashimoto, and K. J. Tom, and J. C. Liu, M.S. and B. Eisenberg-Gelber, B.A., in pursuing the study of neurons of the hypothalamus following administration of various doses of methadone, detected changes of the dense-

core vesicles (catecholamines) and neurosecretory products in the neuronal cytoplasm, axons (un- and myelinated), and synapses. The same type of dense-core vesicles were observed in some vascular walls. The latter seems to indicate their relationship to blood-brain barrier and neurohumoral mechanisms. Dr. L. Roizin and J. C. Liu, with Drs. M. Rapport and H. Tamir and Y. L. Wond, in an investigation of anatomo-topographic characterization of the synaptic complexes "*in vivo*" and "*in vitro*," noted in deatriozoate gradient two distinctive bands which differed in electron microscope appearance and enzyme activities.

Dr. G. J. Alexander and co-workers simplified existing procedures for routine qualitative assays of addictive drugs, including opiates, methadone, barbiturates, phenothiazine, tranquilizers, amphetamines, and related compounds. The modification calls for extraction of specimens in the field by an ion-exchange paper ("The Dole procedure") which is delivered to the laboratory for solvent extraction and single thin-layer chromatographic analysis of the entire extract. Dr. Alexander, with Dr. Roizin, found higher levels of radioactive methadone in the spinal cord, pons, and medulla than in the cortex of young rats but did not demonstrate the existence of specific receptor sites in rat brain. Blocking of methadone sites in the liver, intestines, and adipose tissues with large amounts of nonradioactive drug made more of the labeled methadone available for deposition in the brain.

Acknowledgments

The members of the Department are deeply grateful for the support of their research endeavors by the National Institute of Mental Health, D.H.E.W., the New York State Department of Mental Hygiene, Foundations' Fund for Research in Psychiatry, Andrew Mellon Foundation, Charles E. Merrill Trust, the Wood Kalb Foundation, Association for the Aid of Crippled Children, Ciba-Geigy Corporation, Hoffman LaRoche, Tappan Foundation, Bergen County, New Jersey, Mrs. Elizabeth Dollard, Mrs. Elizabeth Harris, John M. Shaheen, Estate of L. Klosk, Tannenbaum Rubin, and Robinson, Reuben Thomas.

1973 Publications

Psychiatry

- Abdullah, S.
The use of bio-feedback in meditation technique. *J. Contemp. Psychotherap.* 5:101-106, 1973.
- Alexander, G. J.; and Meltzer, H. L.
Rubidium chloride: Appearance of audiogenic seizures in rodents following treatment with near-toxic levels (Abstract). *Fed. Proc.* 32:791, 1973.
- Baer, L.
Electrolyte metabolism in psychiatric disorders. *Biol. Psychia.* J. Mendel, ed. John Wiley & Sons, New York, 1973, pp. 199-234.
- Baer, L.; Brunner, H. R.; Buhler, F. R.; and Laragh, J. H.
Pseudo-primary aldosteronism: A variant of low renin essential hypertension? In: *Hypertension 1972*. J. Genest, J. and E. Koiw, eds., Springer-Verlag, Berlin, 1972, pp. 459-472.
- Baer, L.; Knowlton, A. I. and Laragh, J. H.
The role of sodium balance and the pituitary-adrenal axis in the hypertension of spontaneously hypertensive rats. In: *Spontaneous Hypertension: Its Pathogenesis and Complications*. K. Okamoto, ed. Igaku Shoin, Ltd., Tokyo, 1972, pp. 203-209.
- Barkai, A.; Glusman, M.; and Rapport, M.
Serotonin turnover in the intact cat brain. *J. Pharmacol. & Exper. Therap.* 181:28-35, 1972.
- Barrett, J. E., Jr.; Kuriansky, J. and Gurland, B. J.
Community tenure following emergency discharge. *Am. J. Psychiat.* 128:958-964, 1972.
- Bartalos, M. and Rainer, J. D.
Human chromosome mapping with an ammoniacal silver staining procedure. *Acta Genet. Med. Gemellol.* 21:139-142, 1972.
- Bemporad, J.
Cognitive growth and childhood psychopathology: The concept of finality. *Child Psych. & Human Develop.* 3, 1972.
- Bennett, R.
On longitudinal research in aging: Discussion of several papers using longitudinal research methods. In: *Intellectual Changes from Childhood through Maturity: Some Psychological and Biological Aspects*. L. D. Jarvik and J. Blum, eds. 1973, pp. 143-148.
Review of Juanita Kreps: *Sex in the Marketplace: American Women at Work*. *J. Gerontol.* 27, October, 1972.
- Bennett, R. and Nahemow, L.
Socialization and social adjustment in five residential settings for the aging. *Planning and Action for the Elderly*. D. Kent, R. Kastenbaum and S. Sherwood, eds. Behavioral Publications, New York. 1972, pp. 501-513.
- Bernard, V. W.
About psychiatry, psychiatrists, and social problems. *Am. J. Psychiat.* 130:2, 1973.
- Blum, J. E.; Clark, E. T. and Jarvik, L. F.
The New York Psychiatric Institute study of aging twins. In: *Intellectual Functioning in Adults*. L. F. Jarvik, C. Eisdorfer and J. Blum, eds. Springer Publishing Co., Inc., New York, 1973.
- Bowden, C. L.; Endicott, J. and Spitzer, R. L.
A-B therapist variable and psychotherapeutic outcome. *J. Nerv. & Ment. Dis.* 154:276-286, 1972.
- Carr, A. C.
A self-report questionnaire. *J. Pers. Assess.* 36:525-533, 1972.
- Clark, W. C. and Dillon, D. J.
Signal detection theory analysis of binary decisions and sensory intensity ratings to noxious thermal stimuli. *Percept. & Psychophysiol.* 13:491-493, 1973.
- Clark, W. C. and Mehl, L.
Signal detection theory procedures are not equivalent when thermal stimuli are judged. *J. Exper. Psychol.* 97:148-153, 1973.
- Dain, J. A.; DiCesare, J. L.; Yip, M. C. and Weicker, H.
Recent studies on the enzymes that synthesize brain gangliosides. In: *Glycolipids, Glycoproteins and Mucopolysaccharides of the Nervous System*. Zambotti, Tettamanti and Arrigoni, eds., New York, 1972.
- DiCesare, J. L. and Rapport, M. M.
Availability to neuraminidase of gangliosides and sialoglycoproteins in neuronal membranes. *J. Neurochem.* 20:1781-1783, 1973.
- Dillon, D. J.
The reliability of an extrapolated measure of an average threshold of pain from radiant stimulation. *Percept. & Psychophysiol.* 13:487-490, 1973.
- Dohrenwend, B. S. and Dohrenwend, B. P.
An approach to the problem of valid comparison of psychiatric disorder in contrasting class and ethnic groups from the general population. In: *Psychopathology*. M. Hammer, K. Salzinger and S. Sutton, eds. John Wiley, New York, 1973.
- Druss, Richard G.
Changes in body image following augmentation breast surgery. *Internat. J. Psychoanal. Psychotherap.* 2:248-256, 1973.
- Dunner, D. L.; Gershon, E. S.; Goodwin, F. K.; Murphy, D. L. and Bunney, W. E., Jr.
Excretion of 17-hydroxycorticosteroids in unipolar and bipolar depressed patients. *Arch. Gen. Psychiat.* 26:360-363, 1972.
- Edelson, A. and Nastuk, W.
Pre- and postjunctional effects of 1-fluoro-2,4-dinitrobenzene (FDNB) at the frog neuromuscular function. *J. Physiol.* 229:617-633, 1973.
- Egan, J. and Mahon, E.
Family interviews in child psychotherapy. *Internat. J. Child Psychotherap.* July 1973.
- Egan, J. and Wiener, J.
Heroin addiction in an adolescent population. *J. Am. Acad. Child Psychiat.* January, 1973.

- Endicott, J. and Spitzer, R. L.
What! another rating scale? The psychiatric evaluation form. *J. Nerv. & Ment. Dis.* **154**:88-104, 1972.
- Current and past psychopathology scales (CAPPS): Rationale, reliability, and validity. *Arch. Gen. Psychiat.* **27**:678-687, 1972.
- The value of the standardized interview for the evaluation of psychopathology. *J. Pers. Assess.* **36**:410-417, 1972.
- Erlenmeyer-Kimling, L.
Gene-environment interactions and the variability of behavior. In: *Genetics, Environment, and Behavior: Implication for Educational Policy*. L. Ehrman, G. Omenn, and E. Caspari, eds. Academic Press, New York, 1972.
- Comments on past and present in genetic research on schizophrenia. *Psychiat. Quart.* **46**:363-370, 1972.
- Fieve, R. R.
Human clinical trials with rubidium chloride. *Psychopharm. Bull.* **8**:16-17, 1972.
- Fieve, R. R.; Meltzer, H.; Dunner, D. L., Mendlewicz, J. and Thomas, A.
Rubidium: Biochemical, behavioral and metabolic studies in humans. *Am. J. Psychiat.* **130**:55-60, 1973.
- Fieve, R. R. and Mendlewicz, J.
Linkage studies in affective disorders II. The Xga blood group and manic-depressive illness. (Abstract. Proc. VIII CINP Congress, August, 1972). *Psychopharmacology* **26**:93, 1972.
- Lithium prophylaxis in bipolar manic-depressive illness. (Abstract, Proc. VIII CINP Congress, August, 1972). *Psychopharmacology* **26**:93, 1972.
- Fleiss, J. L.
Classification of the depressive disorders by numerical typology. *J. Psychiat. Res.* **9**:141-153, 1972.
- Statistical Methods for Rates and Proportions*. John Wiley & Sons, New York, 1973.
- Fleiss, J. L. Spitzer, R. L.; Cohen, J. and Endicott, J.
Three computer diagnosis methods compared. *Arch. Gen. Psychiat.* **27**:643-649, 1972.
- Fleiss, J. L. and Tanur, J. M.
The analysis of covariance in psychopathology. In: *Psychopathology: Contributions from the Social, Behavioral and Biological Sciences*. M. Hammer, K. Salzinger, and S. Sutton, eds. John Wiley & Sons, New York, 1973, pp. 509-527.
- Foley, A. R.
Models for training in administration. *Psychiat. Ann.* **3**:1, 1973.
- Foley, A. R. and Gorham, P.
Toward a new philosophy of care: Perspective on prevention. *Community Ment. Health J.* **9**:2, 1973.
- Frazier, S. and Carr, A. C.
Schizophrenia. In: *Family Practice*. H. E. Conn, R. E. Rakel, and T. W. Johson, eds. Saunders, Philadelphia, 1973.
- Other psychoses. In: *Family Practice*. H. E. Conn, R. E. Rakel, and T. W. Johson, eds. Saunders, Philadelphia, 1973.
- Friedman, R. C.; Friedman, J. G. and Ramirez, T.
The heroin overdose as a method of attempted suicide. *Brit. J. Addiction* **68**:137-143, 1973.
- Friedman, R. C.; Kornfeld, D. S. and Bigger, T. J.
Psychological problems associated with sleep deprivation in interns. *J. Med. Education* **48**:436-441, 1973.
- Ganz, V. H.; Gurland, B. J.; Deming, W. E. and Fisher, B.
The study of the psychiatric symptoms of systemic lupus erythematosus: A biometric study. *J. Psychosom. Med.* **34**:207-220, 1972.
- Gardner, R. A.
Little Hans—The most famous boy in the child psychotherapy literature. *Internat. J. Child Psychotherap.* **1**:24-50, 1972.
- Treatment of the projected self. *Internat. J. Child Psychotherap.* **2**:7-12, 1973.
- Psychotherapy of the psychogenic problems secondary to minimal brain dysfunction. *Internat. J. Child Psychotherap.* **2**:224-256, 1973.
- The Family Book about Minimal Brain Dysfunction*. Jason Aronson, Inc., New York, 1973.
- Understanding Children*. Jason Aronsen, Inc., New York, 1973.
- Women's lib, sex role development, and children's play. *Med. Aspects Human Sexuality*, **7**:50-69, 1973.
- Goodwin, F. K.; Post, R. M.; Dunner, D. L. and Gordon, E. K.
Cerebrospinal fluid amine metabolites in affective illness: The probenecid technique. *Am. J. Psychiat.* **130**:73-79, 1973.
- Gordon, S. K. and Clark, W. C.
Adult age differences in recent and delayed prose retention and work recognition memory. *Proc. Am. Psychol. A.* **8**:767-768, 1973.
- Gurland, B. J.; Fleiss, J. L.; Barrett, J. E., Jr.; Sharpe, R. J., et al.
The mislabeling of depressed patients in New York State hospitals. In: *Disorders of Mood*. J. Zubin and F. A. Freyhan, eds. John Hopkins Press, Baltimore, 1972, pp. 17-31.
- Gurland, B. J.; Ganz, V. H., Fleiss, J. L. and Zubin, J.
The study of the psychiatric symptoms of systemic lupus erythematosus: A critical review. *J. Psychosom. Med.* **34**:199-206, 1972.
- Hunt, H. F.
Recent developments in the research psychology department. *Psychiat. Quart.* **46**:432-438, 1972.
- The differentiation of malingering, dissimulation and pathology. In: *Psychopathology*. M. Hammer, K. Salzinger, and S. Sutton, eds. John Wiley & Sons, New York, 1973, pp. 441-445.
- Problems of motivation and behavior in narcotics addiction. *JSAS Catalogue of Selected Documents in Psychology* **3**:54, 1973.
- Hutchings, D. E.; Gibbon, J. and Kaufman, M.
Maternal vitamin A excess during the early fetal period: Effects on learning and development in the offspring. *Devel. Psychobiol.* **6**:445-457, 1973.

- Karpiak, S. E., Jr.; Bowen, F. P. and Rapport, M.
Epileptiform activity induced by antiserum to synaptic membrane. *Brain Res.* 59:303-310, 1973.
- Kaufman, M.A.; Roizin, L. and Gold, G.
Neuropathology. In: *Progress in Neurology and Psychiatry. An Annual Review*, vol. 27. E. A. Spiegel, ed. Grune & Stratton, New York, 1972.
- Kestenbaum, C. J.
Some effects of the 'Sexual Revolution' on the mid-adolescent girl. *Psych. Spectator & Neurologic Psychiatry*, 1973.
Introductory chapter. In: *The Emerging Child*. M. J. Witenberg, and P. Brusiloff, eds. Jason Aronsen, Inc., New York, 1973.
- Kline, N. S. and Baer, L.
Psychotropic drugs. *New York J. Med.* 72:2170, 1972.
- Kolb, L. C.
Against the radical position in community mental health. In: *The Critical Issues of Community Mental Health*. H. Gottesfeld, ed. Behavioral Publications, New York, 1972.
Cultural impairment of our inner resources: An empirical inquiry by Alexander Reid Martin. *Am. J. Psychoanal.* 32:2, 1973.
Research—Reminiscences and prospects. *Proc. Conf. on the 25th Anniversary of the National Mental Health Act, June 28-29, 1971*, Washington, D. C.
Seventy-five years of research and education in psychiatry: Welcoming remarks. Seventy-fifth Anniversary Symposium, New York State Psychiatric Institute. *Psychiat. Quart.* 46:4, 1972.
Psychiatry then and now! *Columbia Reports* 7:6, 1973.
- Kornfeld, D. S.
Treatment of delirium. In: *Current Therapy*. H. Conn, ed., W. B. Saunders, Philadelphia, 1973.
Psychiatric aspects of liver disease. *Emotional Factors in Gastrointestinal Disease*. Excerpta Med., 1973.
- Kutscher, A. H.; Schoenberg, B. and Carr, A. C.
The Terminal Patient: Oral Care. Columbia University Press, New York, 1973.
- Lane, F. M.
Mental mechanisms and the pain of angina pectoris. *Am. Heart. J.*, 85:563-568, 1973.
- Laury, G.
Farwell to the internship. *Suffolk County Med. Bull.*, 5:21, 1973.
Reflections on aging in the United States. *Geriatrics*, 28, 5:178-182, 1973.
Teaching psychiatry to medical students. *Med. & Hyg.* 31:1064-1105, 1973.
Glue sniffing: A communion in drugs and youth. In: *Drug Addiction*. E. Harms, ed. Pergamon Press, New York, 1973, pp. 91-104.
- Leiter, N.
Elective abortion: Woman in crisis. *New York J. Med.* 72:2908-2910, 1972.
- MacKay, M.
Hyperkinetic children with cerebral dysfunction. *Med. Insight*, February, 1973.
Treatment and prognosis for the hyperactive child. *Med. Opinion*, August, 1973.
- MacKay, M.; Beck, L. & Taylor, R.
Methylphenidate for adolescents with minimal brain dysfunction. *New York J. Med.* 75, February, 1973.
- MacKay, M. and Heimlich, E.
Psychotherapy with paraverbal therapy in a case of Gilles de la Tourette syndrome. *Am. J. Psychotherap.* 26:571-577, 1972.
- MacKinnon, R. A.
The psychoneuroses. In: *Current Therapy*. H. F. Conn, ed. W. B. Saunders, Philadelphia, 1973.
- Marco, L. A.; Edelson, A. M. and Gilman, S.
Unit response in anterolateral hypothalamus to local stimulation. *Physiologist*. 15:208, 1972.
- McIlwain, D. L.
Non-osmotic swelling in purified bovine myelin. *Brain Res.* 52:97-113, 1973.
- Mendlewicz, J. and Fieve, R. R.
Differentiation of two genetic subgroups of manic-depressive illness by lithium prophylaxis. (Abstract, Proc. VIII CINP Congress, August, 1972). *Psychopharmacology* 26:90, 1972.
Linkage studies in affective disorders I: Color-blindness and manic-depressive illness. (Abstract, Proc. VIII CINP Congress, August, 1972). *Psychopharmacology* 26:91, 1972.
- Mendlewicz, J.; Fieve, R. R.; Rainer, J. D. and Cataldo, M.
Affective disorders on paternal and maternal sides: observations in bipolar (manic-depressive) patients with and without a family history. *Brit. J. Psychiat.* 122:566:31-34, 1973.
- Mendelewicz, J.; Fieve, R. R. and Stallone, F.
Relationship between the effectiveness of lithium therapy and family history. *Am. J. Psychiat.* 130:1011-1013, 1973.
- Mendelewicz, J.; Fleiss, J. L. and Fieve, R. R.
Evidence for x-linkage in the transmission of manic-depressive illness. *J.A.M.A.* 222:1624-1627, 1972.
- Michels, R.
Cultural changes and their impact on psychic functioning. *Psychiat. Quart.* 46:572-576, 1972.
Ethical issues of psychological and psychotherapeutic means of behavior control. *Hastings Center Rep.* 3:11-13, 1973.
Therapy for the theorists of therapy. *Internat. J. Psychiat.* 11:187-188, 1973.
The right to refuse psychoactive drugs. *Hastings Center Rep.* 3:10-11, 1973.
- Perel, J.; Levitt, M. and Dunner, D. L.
Plasma and cerebrospinal fluid probenecid concentrations as related to accumulation of acidic biogenic amine metabolites in man. *Fed. Proc.* 32:696, 1973.

- Prives, J.; Cowburn, D.; Reiter, M. and Karlin, A.
Affinity labelling of the acetylcholine receptor in the electroplax. Electrophoretic separation in sodium dodecyl sulfate. *Proc. Nat. Acad. Sci.* **69**:1168, 1972.
- Interactions of a cobra neurotoxin and affinity labels of the acetylcholine receptor in the electroplax. *Mole. Pharmacol.* **8**:787-789, 1972.
- Rainer, J. D.
Genetic counseling in a psychiatric setting. In: *Handbook of Psychiatric Therapies*. J. H. Masserman, ed. Science House, New York, 1972.
- Perspective on the genetics of schizophrenia: A reevaluation of Kallmann's contribution—its influence and current relevance. *Psychiat. Quart.* **46**:356-362, 1972.
- Rainer, J. D. and Altschuler, K. Z.
New directions in psychiatry for deaf people. In: *Deafness*, vol. III. A. G. Norris, ed. Prof. Rehabilitation Workers with Adult Deaf, Silver Springs, Md., 1973.
- Roizin, L.; Baden, M.; Hashimoto, S. and Liu, J. C.
Ultrastructural changes of the liver in the narcotism-drug syndrome (Abstract). *Fed. Proc.* **32**:837, 1973.
- Roizin, L.; Hashimoto, S.; Tom, K. J.; and Liu, J. C.
Alterations of intraneuronal transport mechanisms in the hypothalamus (Abstract). *J. Histochem. & Cytochem.* **21**:309, 1973.
- Methadone neurotoxicity. III. Electron microscope investigations. *J. Neuropath. & Exper. Neurol.* **32**:180, 1973.
- Methadone effects upon hypothalamic neuronal organelles. *Proc. Amer. Assn.*, 1973, p. 33.
- Roizin, L.; Helpfer, M.; Baden, M.; Kaufman, M. A., Hashimoto, S.; Liu, J. C. and Eisenberg-Gelber, B.
The neuropathology of drug abuse. In: *Drug Abuse in Industry*. P. A. Carone and L. W. Krimsky, eds. Charles Thomas, Springfield, Ill., 1973, pp. 7-23.
- Salzinger, K.
Inside the black box with apologies to Pandora. *J. Exper. Analysis Behavior.* **19**:369-378, 1973.
- Schizophrenia and the immediacy hypothesis: A reply to Radomski. *Am. J. of Psychotherapy.* **25**:567-570, 1972.
- Salzinger, K.; Portnoy, S.; Pisoni, D. B. and Feldman, R. S.
The immediacy hypothesis and response produced stimuli in schizophrenic speech. *J. Abnorm. Psychol.* **76**:258-264, 1970. (Reprinted in *Annual Review of the Schizophrenic Syndrome: 1972*. R. Cancro, ed. Brunner, New York, 1972-).
- Schoenberg, B. and Carr, A. C.
Psychosocial aspects of oral care in the dying patient. In: *The Terminal Patient: Oral Care*. A. H. Kutscher, B. Schoenberg and A. C. Carr, eds. Columbia University Press, New York, 1973.
- Schumer, F. and Zubin, J.
Projektive Verfahren. In: *Lexikon der Psychologie*. W. Arnold, H. J. Eysenck and R. Meili, eds. Verlag Herder, Freiburg, Germany, 1971-72, pp. 845-851.
- Shelley, E.
The use of lithium in affective disorders. *Am. J. Psychiat.* **130**, September, 1973.
- Singer, Eleanor
Agreement between "inaccessible" respondents and informants. *Pub. Opinion Quart.* **36**, Winter, 1972-1973.
- Social costs of Parkinson's disease. *J. Chron. Dis.* **26**, 1973.
- Sours, J. A.
Play and human development. *Internat. J. Early Childhood.* **5**:139-143, 1973.
- Srole, L.
Urbanization and mental health. A reformulation. *Psychiat. Quart.* **46**, No. 4, 1972.
- Srole, L. and Fischer, A. K.
The social epidemiology of smoking behavior 1953 and 1970: The midtown Manhattan study. *Social Sci. & Med.* **7**, 1973.
- Stallone, F.; Huba, G. J.; Lawlor, W. G. and Fieve, R. R.
Longitudinal studies of diurnal variations in depression: A sample of 643 patient days. *Brit. J. Psychiat.* **123**:311-318, 1973.
- Stallone, F.; Shelley, E.; Mendlewicz, J. and Fieve, R. R.
The use of lithium in affective disorders. III: A double-blind study of prophylaxis in bipolar illness. *Am. J. Psychiat.* **130**:1006-1010, 1973.
- Stokman, C. J.; Orlowsky, W. J. and Glusman, M.
Comparison of aversive thresholds in cats obtained by the methods of titration and constant stimuli. *Psychonom. Sci.* **26**:1-3, 1972.
- Tamir, H.; Huang, Y. L. and Liu, J. C.
Preparation of synaptosomes and vesicles using sodium diatrizoate (Abstract). *Fed. Proc.* **32**:526, 1973.
- Tueting, P. and Sutton, S.
The relationship between pre-stimulus negative shifts and post-stimulus components of the averaged evoked potential. In: *Attention and Performance IV*. S. Kornblum, IV. Academic Press, New York, 1973.
- Weiss, B. and Stiller, R. L.
Sphingolipids of mushrooms. *Biochemistry* **11**:4552-4557, 1972.
- Weiss, B.; Stiller, R. L. and Jack, R. C. M.
Sphingolipids of the fungi *P. blakesleenus* and *F. lini*. *Lipids* **8**:25-30, 1973.
- Wilder, D. E. and Blumner, A. S.
Some Sociological Aspects of Student Allocation in two Racially Mixed Suburban High Schools. Teachers College, New York, 1972.
- Wilmotte, J. and Mendlewicz, J.
Epidemiology of suicidal behavior in one thousand Belgian prisoners. In: *Jail House Blues—Studies of Suicidal Behavior in Jail and Prison*. B. L. Danto, ed. Epic Publishing Co., Orchard Lake, Mich., 1973.
- Zubin, J.
Foundations of gerontology: History, training and methodology. In: *The Psychology of Adult Development and Aging*. C. Eisdorfer and M. P. Lawton, eds. American Psychological Association, Washington, D.C., 1973.
- Zubin, J. and Money, J., Editors.
Contemporary Sexual Behavior: Critical Issues in the 1970's. Johns Hopkins Press, Baltimore, 1973.

Public Health

JOHN H. BRYANT

Professor and Chairman of the Department

The year 1973 saw major developments in the evolution of the School of Public Health. Programs initiated in 1971 and 1972 took concrete form, reflecting institutional efforts to effect change in the teaching and research programs of the School. In December 1973, the School's accreditation by the American Public Health Association (A.P.H.A.) was reaffirmed unconditionally for a five-year period and the programs in Health Administration were similarly accredited by the American University Programs in Health Administration.

The accreditation process involved an extensive self-evaluation in which faculty, administration, students, alumni, community, and representatives of health care providers in New York City were brought together over a period of several months to look at the purposes and programs of the School in ways that are not ordinarily achieved in the day-to-day work of the institution. Findings of the self-analysis have provided new perspectives for the School and its educational, research, and service programs, and plans have been made for continuing discussion of the strengths and weaknesses of the School.

A review of some of the major milestones of 1971-1973 indicates both the positive nature of institutional decisions and some of the forces which have influenced their implementation. For example, a series of faculty-student committees developed plans for changes in educational policies, degree programs, course evaluation methods, grading procedures, admissions activities, a summer term, curriculum committee functions, and the faculty advisory system for

students. Procedures established by the School and University are making the implementation of these plans a reality. New educational programs have been put into effect such as the lengthened M.P.H. program, a joint M.P.H./M.B.A. program, an M.P.H. track in Population and Family Health, and a Ph.D. program in Epidemiology. New program developments in other areas are in process, for example, in health education and in the joint M.P.H./M.S. program with the School of Architecture and Urban Planning, which strongly emphasizes health planning. In discussion stages for future implementation are a number of other innovative programs such as a cooperative venture of the Association of Medical Schools of New York and New Jersey to use the School of Public Health as a regional resource for teaching public health and community medicine, and the development of a nutritional track in the M.P.H. degree program at the School, in conjunction with the Institute of Human Nutrition. The Center for Community Health Systems, established in 1972 as an interdepartmental health care research unit of the Health Sciences, provides a substantial resource of professional research talent. During 1973, administratively and educationally, the Center's activities and staff were increasingly available to enrich the School's programs.

Teaching Faculty

Research and teaching faculty of the School numbered over 225 persons in 1973, of which over 80

were on a full-time basis. During the year, the following new appointments were made:

Bruce P. Dohrenwend, Professor of Public Health (Epidemiology) and Social Sciences (Psychiatry)
 Denise B. Kandel, Ph.D., Adjunct Associate Professor of Public Health (Sociomedical Sciences)
 Howard N. Newman, Adjunct Associate Professor of Public Health (Health Administration)
 Catherine de Angelis, M.D., Assistant Professor of Public Health (Health Administration) and Assistant Professor of Pediatrics; Director of the Nurse Practitioner Program in collaboration with the School of Nursing and Faculty of Medicine
 Brant Fries, M. S., Assistant Professor of Public Health (Health Administration)
 Frederick B. Putney, Ph.D., Assistant Professor of Public Health (Health Administration)
 Paul L. Selbst, Assistant Professor of Public Health (Health Administration) and Assistant Director of the Graduate Program in Health Services Administration
 Raymond S. Alexander, M.B.A., M.S., Adjunct Assistant Professor of Public Health (Health Administration)
 Patricia Cohen, Ph.D., Adjunct Assistant Professor of Public Health (Epidemiology)
 DeWitt L. Crandell, M.D., Adjunct Assistant Professor of Public Health (Epidemiology) and Assistant Clinical Professor of Psychiatry
 William L. Nute, Jr., M.D., Adjunct Assistant Professor of Public Health (Health Administration)
 Janet Wittes, Ph.D., Adjunct Assistant Professor of Public Health (Epidemiology)
 Victoria H. Garvin, M.A., Senior Staff Associate (Health Administration)
 Mary G. McCrear Curnen, M.D., Dr. P.H., Research Associate (Epidemiology)
 Joseph Greenblum, Research Associate (Sociomedical Sciences)
 Everett D. Hines, Research Associate in Public Health (Health Administration)
 Robert W. Jones, Research Associate in Public Health (Sociomedical Sciences)
 Natalie Becker, M.C.P., Instructor (Health Administration)
 Harold Cohen, Staff Associate in Public Health (Health Administration)
 Susan Cohen, Staff Associate in Public Health (Health Administration)
 Daniel Denerstein, Staff Associate in Public Health (Health Administration)
 Carol A. Bodian, Assistant in Public Health (Biostatistics)
 Gary M. Eidsvold, M.D., Lecturer
 Samuel Wolfe, M.D., Lecturer

In 1973, the following promotions and changes of appointment were made:

Zena A. Stein, M.B., B.Ch., from Associate Professor of Epidemiology to Professor of Public Health (Epidemiology)
 Joseph V. Terenzio, from Lecturer to Adjunct Professor of Public Health (Health Administration)
 Arne C. V. Barkhuus, M.D. from Professor of Public Health Practice to Adjunct Professor of Public Health (Health Administration)

Harriet Presser, Ph.D., from Assistant Professor of Public Health (Sociomedical Sciences) to Associate Professor of Public Health (Sociomedical Sciences) (in the International Institute for the Study of Human Reproduction)

David Rush, M.D., from Assistant Professor of Epidemiology to Associate Professor of Public Health (Epidemiology) and Pediatrics

Noreen C. Clark, from Instructor in Public Health (Health Administration) to Assistant Professor of Public Health (Health Administration) and Director of the Program in Continuing Education

Holgar Hansen, M.D., from Assistant in Epidemiology to Assistant Professor of Public Health (Epidemiology)

Wolf Szmunes, D.Phil., from Lecturer in Epidemiology to Adjunct Assistant Professor of Epidemiology

Gloria L. A. Dammann, M.P.H., from Assistant Professor of Public Health to Lecturer (Health Administration) and Assistant to the Head of the Division of Health Administration

Florence Kavalier, M.D., from Adjunct Assistant Professor of Public Health (Health Administration) to Lecturer (Health Administration)

Dulcy B. Miller, M.S., from Assistant in Administrative Medicine to Instructor in Public Health (Administrative Medicine)

The following faculty members left the School during 1973:

Kathleen L. Hussey, Ph.D., Professor of Parasitology
 Elliott C. Roberts, M.A., Adjunct Associate Professor of Public Health (Administrative Medicine) at Harlem Hospital

Vernon F. Spencer, M.S., Adjunct Associate Professor of Administrative Medicine

Conrad E. A. Herr, M.D., Assistant Professor in Administrative Medicine (at Harlem Hospital)

Francis C. Lindaman, M.A., Assistant Professor of Public Health Practice (Continuing Education)

Beatrice Mintz, M.D., Assistant Professor of Administrative Medicine

Martin Saren, M.S., Assistant Professor of Administrative Medicine

James E. Wesley, M.D., Assistant Professor in Administrative Medicine (at Harlem Hospital)

Walter J. Lear, M.D., Adjunct Assistant Professor of Public Health (Health Administration)

Marjorie H. Frank, Instructor in Administrative Medicine

Elliott N. Camerman, Research Associate in Public Health (Sociomedical Sciences)

H. Skipton Leonard, Research Associate in Public Health (Environmental Health Sciences)

Howard Schwartz, Research Associate in Public Health (Sociomedical Sciences)

Jorge Segovia, M.D., Research Associate in Public Health (Sociomedical Sciences)

W. Wayne Curtis, Ph.D., Staff Associate in Public Health (Health Administration)

Bess I. Miller, Staff Associate in Public Health Nutrition
 Robert Galton, Assistant in Public Health Practice

The following faculty returned from sabbatical leaves: Dr. Mervyn Susser; Dr. Zena Stein; Dr. Eric Josephson; and Dr. Frances Gearing.

The following faculty honors and activities in 1973 are noted with pride:

Dr. Lowell E. Bellin was elected to Alpha Omega Alpha, and became a member of the Executive Committee of the Herman Biggs Society.

Dr. Lillian Belmont was awarded a fellowship by the International Rehabilitation Research Program of the Social and Rehabilitation Service (H.E.W.) in connection with research on social aspects of mental retardation.

Dr. Levon Z. Boyajian became a member of the Committee on Psychiatry and the Community, New York Society for Clinical Psychiatry, American Psychiatric Association, New York County District Branch.

Professor Virginia Brown was appointed a member of the Board of Directors of the Public Health Association, New York City.

Dr. John H. Bryant was chosen honorary founding member and keynote speaker of the new Division of Tropical Medicine and International Health of the Canadian Public Health Association, was keynote speaker at the National Council for International Health's conference on Health Care and Human Values, and was guest speaker at Duke University, the University of Illinois, Harvard University, University of London, and Rutgers University.

Dr. Dickson D. Despommier served as coordinator for the 3rd International Conference on Trichinellosis and was appointed an Assistant Editor of the *Journal of Experimental Parasitology*.

Dr. Bruce Dohrenwend was appointed a member of the Advisory Committee on Evaluation Research, New York City Department of Mental Health and Mental Retardation Service.

Dr. Joseph Fleiss, Adjunct Associate Professor of Biostatistics, was awarded the Spiegelman Gold Medal for 1973 by the American Public Health Association.

Dr. Archie R. Foley was elected a member of the Professional Standards Review Committee, New York Society for Clinical Psychiatry, American Psychiatric Association, New York County District Branch.

Dr. Frances Gearing was the recipient of the Merit Award for service to the citizens of New York from the Public Health Association of New York City.

Dr. Seth Goldsmith was appointed as consultant to W.H.O.; to the Committee on Quality of Medical Care in Prisons, New York City Health Services Administration; and he is also a member of the Select Committee on Appointments of Senior Health Officials in the City of New York Public Health Association of New York City.

Dr. Michael Katz, Professor of Tropical Medicine (and of Pediatrics) was elected member of the American Pediatric Society.

Dr. Thomas Langner was appointed to the Review Committee, Center for Epidemiologic Studies, National Institute of Mental Health.

Professor Regina Loewenstein was elected Secretary of the Statistics Section of A.P.H.A.

Dr. David Rush completed two years as chairman of the Program Committee, Epidemiology Section, A.P.H.A.

Dr. Howard Shookhoff, Adjunct Professor of Medicine, received an award for Outstanding Professional

Achievement given by the City of New York and presented by Mayor John V. Lindsay.

Dr. Zena Stein was appointed a member of the American Public Health Association Joint Committee on National Data Resources.

Dr. Mervyn Susser, Professor and Head, Division of Epidemiology, was awarded a fellowship from the John Simon Guggenheim Memorial Fund for 1972-73, to complete a book on the study of the Dutch Famine.

Curriculum and Students

The total School enrollment in September 1973 numbered 208 Masters and Doctoral students, of which 34 were in residency placements and 21 were in nondegree programs. One hundred and twelve students with primary registration in graduate programs in other parts of the University also registered for an average of two to three courses each at the School. Fifty-one students remain in the joint Ph.D. program in sociomedical sciences, 7 of whom were newly admitted in 1973. With the lengthened M.P.H. degree curriculum and the almost total elimination of student support in 1973, there was a surprising increase in numbers of applications to the School and a new trend toward part-time enrollment.

The new lengthened M.P.H. degree curriculum initiated for a few students in January 1973 was put in full operation for all M.P.H. candidates admitted in September 1973. Eighty-six new students registered for this program, over 60 per cent of them concentrating in health administration. This figure includes 22 students who entered the new joint M.P.H./M.B.A. program with the Graduate School of Business.

During 1973 the teaching of community and preventive medicine to medical students was intensively reviewed and recommendations were made to the P&S Curriculum Committee for a new approach, including a series of integrated required and elective courses. A new elective course, "Health and Society," with Dr. John Colombotos as course director, was introduced in 1973 for first-year medical students. It is to be followed early in 1974 by an elective sequence of community-based experiences for 45 first-year students.

The School's program in Continuing Education has two major areas of concern: consumer education and professional education. Up to 2000 professionals and consumers participated in 1973 in the variety of one- to five-day courses and workshops offered. Priority issues for professional education in 1973 included: Executive development, radiation protection, hospital planning, expectant parent education, food service, developing administrative skills, alcoholism, nursing home administration, communication and consultation skills, infection control in

hospitals and drug abuse. Intensive educational activities with consumer groups have taken place in three areas of the City: Central Harlem (with the Harlem Alliance, Inc.), Brooklyn (with the Williamsburgh-Greenpoint Comprehensive Health Planning Board), and the Lower East Side (with the Committee for Better Health Services for the Lower East Side). In addition, the staff has been discussing consumer educational efforts with other groups in Upper Manhattan, Bedford-Stuyvesant, the Bronx, and Chinatown.

Research

The 62 active studies under way at the School of Public Health in 1973 fall roughly into three main types, reflecting the broad scope and perspective of the School's substantive concerns:

Research on health and disease. Laboratory and field research in the Division of Tropical Medicine ranges from a study of the relationship between protein deficiency and infection, with data collected in Guatemala and nearby countries, to a laboratory investigation of functional antigens of *Trichinella spiralis*, the results of which will be sent to the United States Department of Agriculture and the Food and Drug Administration.

Social aspects of mental retardation is the subject of three studies in Epidemiology in which data gathered in Manhattan, Poland, and the Netherlands are developed. Epidemiological studies in mental health problems of urban children is another focus. Research with significance for dental health is pursued from the social science perspective and from the perspective of biostatistical contributions to dental health research. Social diseases, especially alcoholism and drug abuse, are studied in the Divisions of Sociomedical Science and Epidemiology.

Health problems and health care delivery to specific population Groups. Nearly all School divisions give specific attention to the health problems of children. Epidemiologic studies focus on psychiatric impairment in children, childhood leukemia, and mental retardation due to PKU. Sociomedical research approaches problems of teenage drug abuse, and adolescent health in Harlem; the administration of measles vaccine to malnourished children is being evaluated in the Division of Tropical Medicine, and health care delivery to children is a project of the Center for Community Health Systems. The child-bearing period is the focus of epidemiologic research on prenatal care and the effects of nutrition on offspring, and the social research into women's roles and fertility and correlates of abortion-seeking under a permissive law. Problems relating to the aged are

being pursued by faculty in Continuing Education and the Center for Community Health Systems. Occupational groups whose special health problems are under study include missionaries, military personnel and their dependents, and workers in a mercury plant. Delivery of health care to the poor is the subject of studies by faculty members in the Division of Health Administration and School staff in the Center for Community Health Systems.

Organizational forms of health care delivery. Nearly all the research undertaken in recent years by the Division of Health Administration and currently by the Center for Community Health Systems can be cited under this heading. Attention has been given specifically to emergency rooms, hospitals, Blue Cross-Blue Shield and Health Maintenance Organizations, Home Health Services, and a multiphasic screening program. Also relevant are a study of physicians' attitudes toward alternative forms of delivery and to national health insurance, and two studies in the Division of Epidemiology which assess services for the mentally retarded and state-supported methadone maintenance programs in the New York City area.

The geographic scope of the School's 62 active research projects in 1973 was as follows: About half of the studies reflected local concerns, collecting data from populations within the New York Metropolitan region. Of the remainder more than twice as many are international as national. The emphasis in about three-fourth of the studies is primarily applied, and about one-quarter are considered primarily basic. This has implications for the dissemination and use of research findings. At least two-thirds of the studies will be submitted to professional forums outside the School, with about one-third each reporting their findings to health providers and consumer or community groups.

Patient Care and Service

The School of Public Health is committed to a service concept characterized by cooperative relationships of those to be served and those in a position to serve. Current service activities take many forms, for example:

Technical and professional assistance. Almost all members of the faculty serve in consultative or advisory relationships to governmental, professional, private and voluntary agencies and community groups, local, national, and international.

Administrative support for health care services. Affiliation contracts exist between the New York City Health and Hospital Corporation and Columbia University for the provision of professional services to

Harlem and Delafield Hospitals. Through these agreements, the School of Public Health has administrative responsibility for the professional services of the Department of Ambulatory Care at Harlem Hospital and the drug program at Delafield Hospital. In 1973, Dr. Henry L. Hines was appointed Director of Ambulatory Care Services at Harlem Hospital. Under his direction, the services are being reorganized to improve efficiency, quality, and accountability along four lines of effort: extending the arms of the hospital into the home and the patient's environment, utilizing the hospital as an active resource for health education, exploring the value of multiphasic screening in the clinic setting, and improving staff-patient relationships in relation to role perception and work attitudes.

Research. As one example, in 1973 the Harlem Hospital Center Department of Patient Care and Program Evaluation, a research arm of the School within the Division of Sociomedical Sciences, provided valuable new data in response to administrative requests bearing on preparation for accreditation by the Joint Commission on Accreditation of Hospitals, implementation of Federal legislation on professional service review organizations, and the problem of reimbursement for appropriate inpatient length of stay in large inner-city teaching hospitals serving primarily economically deprived black patient populations.

Patient care. The Division of Tropical Medicine provided consultative advice for 104 inpatients at the Columbia-Presbyterian Medical Center and carried out 4,462 diagnostic laboratory tests for parasitic diseases in the inpatient and outpatient population of this Medical Center. The Division of Environmental Health Sciences continued its program of monitoring the health effects of industrial environments upon approximately 200 workers.

Community education. The Program in Continuing Education has extended its program and is work-

ing with community groups throughout the Metropolitan area.

Major Donors to the Training and Research Programs

The School of Public Health gratefully acknowledges the contributions of agencies which helped its teaching and research efforts during 1973. Among the major donors, in addition to those who provided support to School faculty at the Center for Community Health Systems, are: National Institute of Mental Health; National Institute of Child Health and Human Development; National Institute on Alcohol Abuse and Alcoholism; National Center for Health Services Research and Development; Health and Hospitals Corporation of New York City; United States Department of Health, Education, and Welfare, Maternal and Child Health Service; Association for the Aid of Crippled Children; United States Department of Health, Education, and Welfare, Office of Child Development; Health Research Council of the City of New York; National Cancer Institute; New York State Department of Mental Hygiene; National Heart and Lung Institute; National Aeronautics and Space Administration; National Institute of Allergy and Infectious Diseases; New York State Narcotic Addiction Control Commission; United States Department of Health, Education, and Welfare, Comprehensive Health Planning Service; World Health Organization; Agency for International Development; National Institute of Dental Research; The Grant Foundation, Inc.; The van Ameringen Foundation, Inc.; United States Department of Health, Education, and Welfare, Center for Studies of Narcotics and Drug Abuse; United States Department of Health, Education, and Welfare, Division of Dental Health; United States Department of Health, Education, and Welfare, Division of Research Resources; United States Department of Health, Education, and Welfare, Division of Allied Health Manpower; and United States Department of Transportation.

1973 Publications

Public Health

- Bellin, L. E.
Health administrator as a status seeker. *J. Med. Educ.* 48:896-904, 1973.
- If we know what quality care is, why don't we get it? *Mod. Hosp.* 1972, pp. 87-88 (December).
- Inadequacies of health administrators and their production—Notes from the overground. Association of University Programs in Hospital Administration, *Program Notes* 49:35-46, 1972.
- Knotty ethical dilemmas from the field. In: *The Teaching of Medical Ethics*, R. M. Veach, W. Gaylin, and C. Morgan, ed. Hastings Center Publication, Hastings-on-Hudson, N.Y., 1973, pp. 138-141.
- A rare word of defense for Caspar Weinberger. Association of University Programs in Health Administration, *Program Notes* 53:1-6, 1973.
- Should the rabbi know systems analysis? linear programming? Should the Jewish center director know operations research? regression analysis? Should the Jewish civil service know modern administration? *Conserv. Judaism*, 1973, p. 42.
- Bellin, L. E.; Kavalier, F. and Haber, Z.
Proprietary nursing homes in New York City—Some notes on services, payment, patients, and regulation. *Bull. New York Acad. Med.* 49:793-803, 1973.
- Bellin, L. E.; Kavalier, F.; Weitzner, M.; Feldman, L. and Hamlin, R.
Hospital cost and use control via New York City Health Department. *Health Serv. Rep.* 88:133-140, 1973.
- Belmont, Lillian and Birch, Herbert G.
The intellectual profile of retarded readers with normal I.Q. In: *Remedial Readings: Classroom and Clinic*, 2nd ed. L. M. Schell and P. C. Burns, ed. Allyn and Bacon, Boston, 1972, pp. 96-109.
- Boldt, B. F.; Reilly, R. R. and Haberman, Paul W.
A Survey and Assessment of the Current Status of Drug-related Instructional Programs in Secondary and Elementary Educational Institutions. Educational Testing Service, Princeton, N. J., 1973.
- Brunswick, Ann F.
Adolescent health in Harlem. In: *High School Health Fairs*. New York Life Insurance Company, New York, 1973.
- Adolescent health in Harlem. Public Health Association of New York City, *Pub. Health Notes*: 13:4-8, 1973.
- Adolescent health, sex and fertility (Abstract). In: *Dokumentation: Sozialmedizin Oeffentlicher Gesundheitsdienst Arbeitsmedizin*: 322, 1973.
- Bryant, John H.
Health manpower planning in the changing scene of the 1970's. *Mt. Sinai Med. J. (New York)* 40:576-591, 1973.
- International trends toward the humanization of health services. *J.A.M.A.* 224:1772-1775, 1973.
- Obstacles to change in medical education. *World Med. J.* 20:33-36, 1973.
- Budner, S.; Chazin, R. and Young, H.
The indigenous nonprofessional in a multi-service center. *Soc. Casework* 5:54, 1973.
- Bumpass, Larry L. and Presser, Harriet B.
The increasing acceptance of sterilization and abortion in the United States. In: *Toward the End of Growth: Population in America*, C. F. Westoff et al., ed., Prentice-Hall, Englewood Cliffs, N. J., 1973, pp. 33-45.
- Challenor, B. D.
Toward a national health system. *Urban Health* 2:4, 1973.
- Challenor, B. D.; Henry, G. K.; Plumer, S. et al.
A physician-associated program at a municipal hospital. *J.A.M.A.* 225:49-51, 1973.
- Challenor, B. D. and Jones, R. G.
Health, Poverty and Low Income Consumer: A Minority Report. Urban Center, Columbia University, New York, 1972.
- Challenor, B. D. and Onyeani, L. H.
Health and legal services in a disadvantaged community. *Am. J. Pub. Health* 63:810-815, 1973.
- Challenor, B. D.; Wicks, J. and Lythcott, George I.
Community medicine. *Curr. Med. Dialog* 40:334-340, 1973.
- Curnen, M. G. McCrea
A Search for Birth Clustering in Childhood Leukemia and an Attempt to Correlate Influenza during Pregnancy with Leukemia in the Offspring. Columbia University Doctoral Thesis (D.P.H.), New York, 1973.
- Dohrenwend, Barbara Snell and Dohrenwend, Bruce P.
An approach to the problem of valid comparison of psychiatric disorders in contrasting class and ethnic groups from the general population. In: *Psychopathology*, M. Hammer, K. Salzinger, and S. Sutton, ed. John Wiley, New York, 1973, pp. 13-31.
- Fleiss, J. L.
Statistical Methods for Rates and Proportions. John Wiley, New York, 1973.
- Fleiss, J. L.; Spitzer, R. L.; Cohen, J. and Endicott, J.
Three computer diagnosis methods compared. *Arch. Gen. Psychiat.* 27:643-649, 1973.
- Foley, Archie R.
Models for training in administration. *Psychiat. Ann.* 3:1, 1973.
- Foley, Archie R. and Gorham, Peter
Toward a new philosophy of care: Perspectives on prevention. *Community Ment. Health J.* 9:2, 1973.
- Frick, Henry Clay, II; Munnell, Equinn W.; Richart, Ralph M.; Berger, Agnes P. and Lawry, Margaret F.
Carcinoma of the endometrium. *Am. J. Obst. & Gynec.* 115:663-676, 1973.

Gearing, F. R.

Myth versus fact in long term methadone maintenance treatment: The community's viewpoint. *Proc. Fifth National Conference on Methadone Treatment*, NAPAN I:452-455, 1973.

Treatment of opiate abuse by methadone treatment. In: *Psychopharmacological Agents*, III. M. Gordon, ed. Academic Press, New York, 1973.

Geiger, A. M.; Wasserman, B. H. and Turgeon, L. R. Relationship of occlusion and periodontal disease. Parts V and VI. *J. Periodont.* 43:554-560, and 44:150-158, 1973.

Gersten, Joanne C.; Langner, Thomas S.; Eisenberg, Jeanne G.; Greene, Edward L.; Herson, Joseph H. and McCarthy, Elizabeth D. *Family and Social Factors in the Behavior of Urban Children and Adolescents*. Columbia University Press, New York, 1973.

Ginsberg, Allen S.

The diagnostic process viewed as a decision problem. In: *Computer Diagnosis and Diagnostic Methods*, John A. Jacquez, ed. Charles C. Thomas, Springfield, Ill., 1972, pp. 203-240.

Goldsmith, S. B.

Can the military serve civilian needs? *Hospitals* 47:68-71, 1973.

The health planks: A mechanism for participation and prediction? *Am. J. Pub. Health* 63:594-601, 1973.

Jailhouse medicine: A travesty of justice. *Health Serv. Rep.* 87:767-774, 1972.

Greene, Edward L.; Langner, T. S.; Herson, J. H.; Jameson, Jean D.; Eisenberg, J. G. and McCarthy, E. D. Some methods of evaluating behavioral variations in children six to eighteen. *J. Am. Acad. Child Psychiat.* 12:3-7, 1973.

Gross, P. A., Green, R. H., and Curnen, M. G. McCrea Persistent infection with parainfluenza type 3 virus in man. *Am. Rev. Respir. Dis.* 108:894-898, 1973.

Gurland, B. J.; Ganz, V. H.; Fleiss, J. L. and Zubin, J. The study of psychiatric symptoms of systemic lupus erythematosus: A critical review. *Psychosom. Med.* 34:199-206, 1972.

Haberman, Paul W.

Consumers of Washington Heights Family Planning Center, New York City and Community Comparison Women. *Am. J. Pub. Health* 63:191, 1973.

Family planning research in New York City. *Family Plan.* 21:8-10, 1973.

Recent studies in epidemiology: A review. *Soc. Sc. Med.* 7:83-84, 1973.

Hansen, Holger

Risk of fetal damage in maternal phenylketonuria. *J. Pediatr.* 83:506-507, 1973.

Hartsook, Rosa; Angus, G. D. and Bloom, Robert Structured job descriptions for occupational therapy. *Am. J. Occup. Ther.* 26:424-433, 1972.

Hazen, S. P.; Chilton, N. W. and Mumma, R. D., Jr. The problem of root caries. I. Literature review and clinical description. *J. Am. Dent. A.* 86:137-144, 1973.

Helbig, Donald W.

Physical and biological aspects. Chapter VI. In: *Human Sexuality and the Mentally Retarded*, F. F. de la Cruz and Gerald D. LaVeck, ed. Brunner/Mazel, New York, 1973, pp. 86-93.

The importance of the "soft dimensions" in training for family planning management. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June, 1972*. Ford Foundation, New York, 1973, pp. 41-45.

Program evaluation as a management tool: Both technology and a state of mind. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June, 1972*. Ford Foundation, 1973, pp. 239-256.

Helbig, Donald W. and Blumstein, Alfred

Impressions of the Louisiana program. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June, 1972*. Ford Foundation, New York, 1973, pp. 71-78.

Helbig, Donald W.; Wickham, Robert S.;

Blumstein, Alfred and Farley, John

Improved management of family planning and population programs. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June, 1972*. Ford Foundation, New York, 1973, pp. 9-31.

Hoover, A. Walter and Patel, Dhun B.

Analysis of mercury compounds by gas liquid chromatography (GLC) utilizing an electron capture detector (ECD). *J. Am. Ind. Hyg. A.* 34:337, 1973.

How to make the ECD-GLC method acceptable for routine analysis of organomercury compounds. (Abstract). In: *Trace Substances in Environmental Health VI*: D. D. Hemphill, ed. University of Missouri, Columbia, Mo., 1973, p. 311.

Josephson, Eric

The British response to drug abuse. Appendix to Second Report of the National Commission on Marijuana and Drug Abuse. In: *Drug Use in America: Problem in Perspective*. U. S. Government Printing Office, Washington, D. C., 1973, p. 86.

Josephson, Eric and Josephson, Mary

Alienation: Contemporary sociological approaches. In: *Alienation: Concepts, Term and Meanings*. Frank Johnson, ed. Seminar Press, New York, 1973, pp. 163-181.

Kandel, D.

Adolescent marijuana use: Role of parents and peers. *Science* 181:1067-1070, 1973.

Katz, M.; Käckell, Y.; Müller, D.; Meulen, V. ter and Koprowski, H.

Immunohistological, microscopical and neurochemical studies on encephalitis. VII. Subacute sclerosing panencephalitis. Susceptibility of dog to the virus and characterization of host response. *Acta Neuropath.* 25:81-88, 1973.

- Katz, M. and Koprowski, H.
The significance of failure to isolate infectious viruses in cases of subacute sclerosing panencephalitis. *Arch. Gesamte Virusforsch.* 41:390-393, 1973.
- Katz, M.; Koprowski, H. and Moorhead, P.
Transformation of cell cultures derived from human brains. *Science* 179:1019, 1973.
- Langner, Thomas S.; Gersten, Joanne C.; Eisenberg, Jeanne G.; McCarthy, Elizabeth D.; Greene, Edward L.; Herson, Joseph H.; Jameson, Jean D. and Tempkin, Suzanne
A screening score of assessing psychiatric impairment in children 6 to 18. In: *Brief Psychosocial Stress for Community Studies*, R. Prince, editor, National Educational Consultants, Baltimore, Md., 1973.
- Mendlewicz, J.; Fieve, R. R.; Stallone, F. and Fleiss, J. L.
Genetic history as a predictor of lithium response in manic-depressive illness. *Lancet* 1:599-600, 1972.
- Mendlewicz, J.; Fleiss, J. L. and Fieve, R. R.
Evidence for x-linkage in the transmission of manic-depressive illness. *J.A.M.A.* 222:1624-1627, 1972.
- Meulen, V. ter; Müller, D.; Käckell, Y. M. and Meyerman, R.
Isolation of infectious measles virus in measles encephalitis. *Lancet* 2:1172, 1972.
- Müller, D.; Katz, M.; Rorke, L. B.; Meulen, V. ter and Koprowski, H.
Immunohistological, microscopical and neurochemical studies on encephalitis. VI. SSPE, Histochemical analysis of experimental ferret encephalitis induced by SSPE viruses. *Acta Neuropath.* 24:12, 1973.
- Nag, M.
Anthropology and population. *Population Stud.* 27: 59-68, 1973.
Cultural factors affecting family planning. *J. Family Welfare* 19:3-7, 1973.
Population anthropology: Prospects and perspectives. In: *Explorations in Anthropology: Readings in Culture, Man and Nature*. Morton M. Fried, ed. Thomas Y. Crowell, New York, 1973, pp. 254-273.
Tribal-nontribal fertility differential in India. *Demography India* 2:104-120, 1973.
- Presser, Harriet B.
Perfect fertility control: Consequences for women and the family. In: *Toward the End of Growth: Population in America*. C. F. Westoff, et al., ed. Prentice-Hall, Englewood Cliffs, N. J., 1973, pp. 133-144.
Sterilization and Fertility Decline in Puerto Rico. Population Monograph No. 13, Institute of International Studies. University of California, Berkeley, Calif., 1973.
- Rush, D.
Perinatal mortality, race, status, and hospital of birth. The association with birthweight. In: *The Problem of Congenital Defects: New Directions*, D. T. Janerich, R. G. Skalko, and I. H. Porter, ed. Academic Press, New York, 1973.
- Rush, D.; Davis, H. and Susser, M. W.
Antecedents of low birthweight in Harlem, New York City. *Internat. J. Epidemiol.* 1:393-405, 1972.
- Rush, D.; Stein, Z. A.; Christakis, G. and Susser, M. W.
The prenatal project: The first twenty months of operation. *Proc., Symposium on Nutrition and Fetal Development*, M. Winick, ed. John Wiley, New York, 1973.
- Rush, D.; Stein, Z. A. and Susser, M. W.
The rationale for the design of a randomized controlled trial of nutritional supplementation in pregnancy. *Nutr. Rep. Internat.* 7:547-553, 1973.
- Shapiro, Arthur K. and Struening, Elmer L.
Defensiveness in the definition of placebo. *Compr. Psychiat.* 14:107-120, 1973.
The use of placebos: A study of ethics and physicians' attitudes. *Psychiatry in Med.* 4:1, 1973.
- Shookhoff, H. B.
Malaria in New York City. I. History of disease 1796-1903. *New York J. Med.* 73:2372-2381, 1973.
- Simon, R. J.; Fleiss, J. L.; Gurland, B. J.; Stiller, P. R. and Tharpe, L.
Depression and schizophrenia in hospitalized black and white mental patients. *Arch. Gen. Psychiat.* 28: 509-512, 1973.
- Stein, Z. A. and Polkes, A. V.
The prevention of Down's syndrome. *Ann. Clin. Res.* 5:65-67, 1973.
- Stein, Z. A. and Susser, M. W.
The epidemiology of mental performance. In: *American Handbook of Psychiatry*, Vol. III, American Psychiatric Association, 1972.
- Stein, A. Z.; Susser, M. W. and Guterman, A. V.
A screening program for the prevention of Down's syndrome. *Lancet* 1:305-310, 1973.
- Stein, Z. A.; Susser, M. W.; Saenger, G. and Marolla, F. A.
Intelligence test results of individuals exposed during gestation to the World War II famine in the Netherlands. *Tijdschr. Soc. Geneesk.* 50:766-774, 1972.
Nutrition and mental performance. *Science* 178:708-713, 1972.
- Struening, Elmer L.; Rabkin, Judith G.; Cohen, Patricia; Raabe, Gerhard; Muhlin, Gregory L. and Cohen, Jacob
Family ethnic and economic indicators of low birth weight and infant mortality: A social area analysis. *Ann. New York Acad. Sc.* 218:87-107, 1973.
- Varma, A. O.; Bugatch, E. and German, F.
Debridement of dermal ulcers with collagenase. *Surg., Gynec., Obst.* 136:281-282, 1973.
- Varma, A. O.; Chilton, N. and Kutscher, A. H.
Studies in the design and analysis of dental experiments. 14. Replicate Latin squares. *J. Dent. Res.* 52: 23-25, 1973.

Radiology

WILLIAM B. SEAMAN

Professor and Chairman of the Department • Director of Service

The radiological sciences' role in the detection of disease and in patient care continues to expand. Procedures predicted a decade ago are now used daily. In the Annual Report of 1965 I suggested that diagnostic radiology be redefined to include new techniques utilizing systems others than the conventional roentgenogram. Radiology concerns itself with displays of all types, whether on x-ray films, oscilloscopes, or computers. Thus scanning procedures based on emanations from internally deposited radioactive isotopes and recordings of pulsed ultrasound or infrared radiation are within the province of diagnostic radiology. Diagnostic ultrasound has already proved its worth in evaluating cardiac valvular function, detecting fetal and placental abnormalities and differentiating cystic and solid abdominal masses. New instrumentation permits dynamic recording of myocardial function and visualizing the lumen of the aorta, allowing detection of aneurysms and thrombi. The Department has pioneered in this area, largely through the efforts of Dr. Donald L. King. We now need additional space and personnel to continue development of this fascinating and valuable technique.

Radiology has entered the computer age, not merely in billing, statistics, and radiotherapy treatment planning, but in generating and delivering x-ray reports, enhancing the radiographic image, and imaging internal structures. A scanner now commercially available generates cross-sectional brain images that delineate not only bone but cerebrospinal fluid, white and grey matter, cerebral ventricles, and any abnormal masses, whether tumor, blood, pus, or

necrotic tissue—without introducing any contrast medium, needles, or catheters, and thus without hazard or discomfort to the patient. Such an instrument it is hoped, will become operational here during the coming year. Similar instruments are being developed for abdomen and chest.

Another development is the application of radiological techniques in treating certain diseases, i.e., "remedial" or "interventive" radiology. Not only can gastrointestinal hemorrhage be detected and accurately localized by selective arteriography: With the catheter in place, a vasoconstricting drug (Vasopressin) can be infused, frequently controlling the bleeding. Dr. William Casarella and his associates have accomplished this in a number of patients with massive lower intestinal bleeding.

Dr. Sadek Hilal, after selectively placing a catheter in a vessel supplying an inoperable brain tumor, can plug the vessel by injecting small particles of various materials. With the tumor's blood supply thus occluded, symptoms can be significantly relieved.

Thus radiology is constantly expanding and changing, and today we stand on the threshold of a whole new world of possibilities that result from the aforementioned developments.

Staff Changes

Dr. John H. M. Austin from the University of California in San Francisco joined our staff. Dr. Austin is interested in pulmonary physiology and disease and has done important research in this area. Drs. Stuart Fuld, Kenneth Jewel, Edward J. Pollock,

and Richard Bridenbaugh resigned to enter private practice. The staff was strengthened by the additions of William Green, Herbert Gerstein, Lawrence Muroff, and Paul Sane.

The Department was saddened by the death of Dr. William Gross, a member of the Radiological Research Laboratory for over two decades. Dr. Gross' many contributions and friendship will be sorely missed.

The arrival of Drs. Peter Joseph and Peter Esser has greatly strengthened our physics staff. Dr. Esser is working in the division of Nuclear Medicine; Dr. Joseph devotes his time to the problems of diagnostic radiology.

Dr. Husnu Demairag resigned from the Francis Delafield Hospital; his place was taken by Dr. Michael Cooper.

Teaching Activities

Dr. Frieda Feldman's annual postgraduate course on the radiology of bone and joint disease continues to be well attended. Over 400 people attended a five-day course on neuroradiology organized by Dr. Ernest Wood and his staff. Courses in radiobiology and radiological physics were given again by Dr. Eric Hall. A postgraduate course in radiation biophysics given by Drs. Harald Rossi, Eric Hall, Victor Bond, Albrecht Kellerer, and William Gross was attended by participants from all over the United States.

Staff Activities

Dr. Seaman was installed as President of the American Roentgen Ray Society during the Annual Meeting in Montreal and was elected President of the Society of Gastrointestinal Radiologists. He continues as Chairman of the Radiology Committee of the National Academy of Sciences, National Research Council, a member of the Part III Committee of the National Board of Medical Examiners, and a guest examiner of the American Board of Radiology. His election as a Trustee of the Presbyterian Hospital during the past year greatly honored him.

Dr. Kent Ellis was elected Vice-President of the New York Roentgen Society. He continues to be a member of the Publication Committee of the American Roentgen Ray Society, and of the Radiology Review Panel of the Inter-Society Commission for Heart Disease Resources. Dr. Guy Potter gave the Preston Hickey Lecture at the Michigan Radiological Society and became a Fellow of the American College of Radiology.

Dr. Chu H. Chang became Chairman-Elect of the Section of Radiation Therapy of the New York Roentgen Society. He continues to serve as Chair-

man, Task Force on Brain Tumor, Radiation Therapy Oncology Group, and as a member of the Research Committee, Radiotherapy Commission, of the American College of Radiology.

Dr. Rossi has been named President-Elect of the Radiation Research Society. He continues his work as Chairman of the Technical Advisory Committee on Radiation to the Mayor of the City of New York. He is a member of the main Commission of the International Commission on Radiation Units and Measurements (ICRUM), is on the Board of Directors of the National Council on Radiation Protection & Measurements, and is Chairman of the Advisory Committee on Radiation Biology Aspects of Supersonic Transport. Dr. Kellerer continues to serve on the ICRUM's main Commission and Committee on the Fundamental Quantities & Units. Dr. Hall serves on the Radiological Advisory Panel to N.A.S.A.

Francis Delafield Hospital

Radiotherapy Division

Dr. Ruth J. Guttman completed evaluating the approach and results in cancer of the uterine cervix and endometrium. She also is studying the effect of radiation on inoperable carcinoma of the lung in various stages of breast carcinoma. Results of radiotherapy in carcinoma of the bladder, prostate, and kidney and in various bone tumors are also being evaluated.

Diagnostic Division

Radiographic study of abdominal neoplasms is being conducted by all members of the Department. They are also studying retrotracheal and retrobronchial recesses as they appear on lateral views of the chest, with particular reference to findings in the region of the carina.

Radiological Research Laboratories

Varied experiments in radiological physics and radiobiology were conducted at the Radiological Research Accelerator Facility (RARAF), managed by Mr. Leon Goodman. This joint enterprise between the Medical Department of Brookhaven National Laboratory and the Radiological Research Laboratory utilizes a 5,000,000-volt van de Graaff accelerator to produce neutrons with 100-keV to 15-MeV energies. This facility is also used for an international Neutron Dosimetry Intercomparison, sponsored by the ICRUM.

Drs. Gross and John Dicello, with Mr. Robert Dvorak, studied the energy event distributions for a number of different radiation types. These include neutrons from RARAF, heavy charged particles

from the Yale HILAC, and low energy x-ray photons. Theoretical studies, using largely physical and biological data obtained in this laboratory, were developed considerably by Drs. Rossi and Kellerer. The theory of dual radiation action was extended and applied to the physical and radiobiological data for high-energy heavy ions measured by the Princeton Particle Accelerator.

The data from Hiroshima and Nagasaki on the incidence of leukemia as a function of radiation dose were reanalyzed in the light of recent radiobiological experiments, using powerful new statistical methods. It was concluded that data from the two cities cannot be pooled, and that prior risk estimates are excessive.

Dr. Carmia Borek exposed fresh explants of hamster embryo-cells to x-rays or neutrons and studied the incidence of malignancy as a function of dose. Dr. Borek also investigated surface alterations and chromosome complements in normal and neoplastic cells. Dr. Hall made extensive comparative radiobiological measurements using neutron beams currently being introduced into radiotherapy. Further studies were completed with the man-made nuclide californium-252, which emits neutrons and gamma rays. This nuclide is now being tested as a replacement for radium in a limited number of human cancer patients. Dr. Alan Underbrink compared the efficiency of neutrons and x-rays in producing somatic effects in *Tradescantia*.

Research Activities

Dr. Ellis with Drs. Ellen Silverstein and Marianne Wolff (Pathology) is studying radiologic and pathologic features of diffuse hamartomatous processes involving the lungs. With Dr. C. Jaffe Dr. Ellis is devising radiographic techniques for determining left ventricular volume and correlating these data with myocardial performance measurements. Mediastinal mass lesions due to granulomatous disease, particularly tuberculosis, were studied by Drs. Harry Morgan and Ellis.

The results of regional myocardial perfusion as measured by xenon washout radionuclide techniques are being compared in detail with findings at coronary arteriography in patients with coronary arteriosclerosis by Drs. Ellis and William J. Casarella with Drs. Donald Schmidt (Medicine), M. Weiss (Medicine), and Paul Cannon (Medicine). The disordered left ventricular contractions in coronary artery disease are being analyzed in a joint project with Drs. Lynn Johnson (Medicine) and Ellis. An effort is being made to relate data on the performance of individual regions of the left ventricle to local differ-

ences in myocardial perfusion. Dr. Ellis with Dr. Nestor Truconi (Pediatrics) is also measuring instantaneous changes in left ventricular performance throughout selective angiocardiology in order to document the effects of contrast material on cardiac function.

Dr. John H. M. Austin is studying narrowing of the air passages in the canine lung due to pulmonary thromboembolism, utilizing magnification tantalum bronchography. It is possible that a nervous reflex leads to the observed narrowing. Nerve-blocking drugs will be tested to determine whether the narrowing can be reversed.

Dr. Casarella with Drs. Chang and John Senyszyn is investigating, in the laboratory, the use of vasoconstricting agents as protectors against radiation effects as an adjunct to radiotherapy. Drs. Casarella and Shelby Galloway are continuing their study of the angiographic diagnosis and treatment of massive lower intestinal bleeding. Dr. Galloway developed a technique for nonoperative removal of retained biliary-tract stones.

Dr. Potter has been studying the radiological aspects of facial nerve surgery. He is also analyzing the importance of early diagnosis of cancer involving the hard palate.

Drs. Philip Sorabella, William Campbell, and Seaman developed a new technique for analyzing enlargement of the body and tail of the pancreas. An axial view of the pancreas is proving to demonstrate reliably such enlargement even when all other views are within normal limits. This method is now being tested in carcinoma of the pancreas and pancreatitis.

Dr. King of the Division of Ultrasound showed the feasibility of ultrasonic cross-sectional imaging of the heart, using a stop-action technique. He demonstrated the anatomic characteristics of transposition of the great vessels and, in a significant percentage of patients, large ventricular septal defects. Cardiac imaging has been greatly extended by development of a real-time ultrasonic cardiac scanner which uses a linear array of many ultrasound beams. The size, shape, relative orientation, and motion of internal cardiac structures may be observed instantaneously and directly. This promises to provide a significant advance in cardiac diagnosis. Dr. King also studied the use of conventional cross-sectional ultrasonography in clinical evaluation of renal masses. This is a safe and practical means for differentiating cystic and solid masses, as well as nonfunctioning hydro-nephrosis and polycystic disease. Ultrasonography has also been used to localize the placenta and predict placenta previa. Because it is noninvasive and harmless, placental ultrasonography has replaced

radioisotopic techniques in this role.

Dr. Hilal developed a magnetically guided system for inserting a catheter into abnormal vessels supplying arteriovenous malformations and vascular tumors and is now developing a liquid material that solidifies on contact with blood. Dr. Hilal, with Drs. Cannon (Medicine) and Philip Johnson of the Division of Nuclear Medicine, has been studying the effect of hypertension on alteration of cerebral blood flow, using the xenon technique and magnification cerebral angiography. Drs. Hilal and Loren Burger, with Dr. S. Gilman (Neurology) have been studying the effect of intrathecal water-soluble contrast agents on the electrical evoked cortical spinal response in the cat. A model was developed for study of the neurotoxicity of these materials. This work may lead to development of safer water-soluble contrast materials for angiography and myelography. Dr. Hilal with Dr. Bruce Wiley and A. Stanek (Pathology) is correlating the angioarchitecture of various tumors as seen on magnification views with neuropathological findings.

Dr. Senyszyn is using the recently acquired PDP-8 computer to study the three-dimensional dose distribution of radium to develop a new concept of safe bladder and rectal dose limits for patients treated with combined external and intracavitary radiation.

Dr. Chang with Dr. John Conley (Surgery) investigated the radiotherapy of advanced oropharyngeal cancer under hyperbaric oxygenation. They found a considerably higher local tumor clearance rate and five-year survival in the group irradiated under hyperbaric oxygenation. Dr. Chang, with Drs. Robert Hui (Otolaryngology), Konard C. Hsu (Microbiology), and Berge Hampar (N.I.H.) began a systematic immunological study of nasopharyngeal cancer. They studied the change of anti-EB virus titer during and following radiotherapy of nasopharyngeal cancer as a clue to the response and prognosis of the patient. With Dr. Harisiadis, Dr. Chang initiated immunodeficiency skin tests on patients with brain, breast, lung, and ovarian cancers undergoing radiotherapy.

Dr. Robert L. Waldron is investigating the effect of angiographic contrast media at the cellular level in the brains of experimental animals. He showed that repeated injections of contrast material cause reversible changes at the capillary level. Using electron microscopy he also showed that the junctions between the capillary linings open up and that there is increased transport across these lining cells.

Dr. Johnson with Dr. S. Werner (Medicine) is investigating the therapeutic effects of iodine-125 in hyperthyroidism. With Drs. John Laragh (Medicine)

and D. Vaughan (Medicine) Dr. Johnson continues to investigate dynamic renal imaging in patients with various types of hypertension. With Dr. L. Muroff Dr. Johnson is concluding an investigation of the vascular area of focal intrahepatic masses using blood specific tracers.

Studies based on intraarterial pressure and blood flow measurements in this institution have shown that atherosclerotic lesions in the extracranial carotid which result in symptoms often do not diminish blood flow in this artery. Many observations, including those at cerebral angiography, the presence of potential embolic material adherent to the lesion, as seen at surgery, the finding post mortem of cerebral arteries occluded by emboli, and the visualization during life of retinal arterioles occluded by emboli, led to the conclusion that thromboembolic events were important. These events appear to be the major cause of transient episodes of cerebral ischemia as well as of cerebral infarcts and most of the complications of surgical intervention. Dr. Ernest Wood is collaborating with Dr. J. Correll in these investigations.

It was found that the carotid atheromatous lesion can be removed intact, without opening the lumen of the artery at the site of the lesion. In collaboration with Dr. Philip Duffy (Pathology) preliminary information concerning the detailed morphology of the active lesion has already been obtained. Investigation of clotting mechanisms and also of thrombolysis in patients with ischemic disease of the central nervous system is being undertaken with the help of Drs. Lewis Rowland and Ralph Richter.

Dr. Donald Beeckler, Neuroradiology Fellow, is working with Drs. Hilal and E. Jost Michelsen on arteriovenous malformations subjected to embolization therapy. Blood flow is determined before and after embolization to assess its effectiveness in decreasing shunting of blood through abnormal vessels away from normal brain. A quantitative method for evaluating effectiveness of therapy is being developed.

All patients with a history of subarachnoid hemorrhage are investigated by early angiography and the study of cerebral blood flow by Drs. Wood, James Hammill, and Michelsen.

The participation of the Neuroradiology Section in the Heart and Stroke Center includes high-magnification serial angiography, using a 0.1 mm. focal spot x-ray tube, with visualization of vessels of 100 μ diameter.

The intensive program to measure regional cerebral blood flow continues. The multi-crystal Bair atomic autofluoroscope is used to measure simultaneously the blood flow in 291 regions of the brain after

intracarotid injection of radioactive xenon.

A computer program was developed to determine regional blood flow and its distribution into fast and slow compartments. Physiological imaging with depiction of flow magnitudes by varying intensities on Polaroid film was also developed.

With Drs. Hilal, Wood, and Duffy, Dr. Wiley continued to study CNS tumor angioarchitecture, to correlate vascular structure patterns of various tumors with their histologic character.

With Drs. Hilal, Sane, Wood, and Wiley, a study of the routes of venous drainage of the brain in normal and various pathologic states has been started, using clinical cerebral angiograms and radiographic subtraction.

Acknowledgments

The Department gratefully acknowledges support from the following donors: National Cancer Institute; J. P. Yancey Foundation; Mrs. Morris M. Rothman; Mr. & Mrs. Daniel L. Monroe; Mr. Edwin Heft; Mrs. Kate Heft; Mrs. Fred G. Krueger; James Picker Foundation; American Lung Association; John Hartford Foundation; and National Institute of Neurological Disease & Stroke.

Statistics

For the first time in several decades, there has been no increase in the total number of examinations done by the Department of Radiology. However, the numbers alone are misleading, since they fail to reflect the increasing number of complicated procedures, which require many hours work on the part of several people.

The reduction in the ultrasound work load does not reflect a decreasing demand for the valuable diagnostic procedure but the loss of our entire technical staff last spring. Since trained ultrasound technicians are not available, new personnel had to be hired and trained, a process requiring a minimum of

six months. The work load in this area has been limited by the presence of only one radiologist in this area.

The figures for Presbyterian Hospital also include the work done in the new emergency service, which opened October 1, 1973. This will be recorded separately in next year's statistics.

DIAGNOSTIC DIVISION

	1973	1972
Atchley/Harkness Pavilion	53,301	52,213
Babies Hospital	27,550	27,852
Presbyterian Hospital	118,113	120,069
Urology	6,320	6,576
Neurological Institute	26,045	28,162
Institute of Ophthalmology	1,759	1,763
Angiography	1,437	1,390
	234,525	238,025

RADIOTHERAPY

	1973	1972
Total New Patients	1,199	1,159
Total Number Treatments	23,898	23,632

ULTRASOUND

	1973	1972
Number Examinations	3,240	5,436

NUCLEAR MEDICINE

Scanning Procedures	1973	1972
Liver	1,708	1,511
Thyroid	826	822
Bone	451	211
Renal	169	119
Spleen	12	135
Lung	843	895
Other	173	1,014
	4,282	4,707

	1973	1972
Thyroid Uptake	1,216	1,198

In Vitro Tests	1973	1972
T ₃ Resin Uptake	7,156	6,393
Schilling Test	95	88

1973 Publications

Radiology

Baker, D. H. and Berdon, W. E.

Chapters on gastrointestinal and genitourinary tracts, special procedures, and neonatal chest. In: *Pediatric Radiology*, 6th ed. John Caffey, ed. Year Book Publishers, Chicago, 1973.

Berdon, W. E.; Baker, D. H. and Posnanski, A.

Opacification of the retrosternal lymph nodes following barium peritonitis. *Radiology* 100:171-173, 1973.

Berdon, W. E.; Wigger, H. J. and Baker, D. H.

Fetal renal hamartoma—A benign tumor to be distinguished from Wilms tumor. *Am. J. Roentgenol.* 118:18-27, 1973.

Borek, C.

In vitro cell transformation by x-rays. (Abstract). *Radiat. Res.* 95:24, 1973.

Borek, C.; Grob, M. and Burger, M. M.

Surface alterations in epithelial and fibroblastic cells in culture. A disturbance of membrane degradation versus biosynthesis. *Exper. Cell Res.* 77:207-215, 1973.

- Borek, C. and Hall, E. J.
Transformation of mammalian cells in vitro by low doses of x-rays. *Nature* 244:450-453, 1973.
- Brill, P. W.; Baker, D. H. and Ewing, M. L.
Neonatal spine stress changes or normal development. *Radiology* 108:363-366, 1973.
- Brown, D.; Hilal, S. K.
Arteriovenous malformations of the mandible maxilla cerebrum and orbit. Report of a case with a 20 year followup. *J. Oral Surg.* 31:553-555, 1973.
- Brown, D.; Hilal, S. K. and Tenner, M.
The Wyburn-Mason syndrome. *Arch. Neurol.* 28:67, 1973.
- Campbell, W. L.; Santiago, H. E.; Perzin, K. H. and Johnson, P. M.
The autonomous thyroid nodule: Correlation of scan appearance and histopathology. *Radiology* 107:133-138, 1973.
- Campbell, W. L. and Wolff, M.
Retrorectal cysts of developmental origin. *Am. J. Roentgenol.* 117:307-313, 1973.
- Chang, C. H.; Conley, J. J. and Herbert, C.
Radiotherapy of advanced carcinoma of the oropharyngeal region under hyperbaric oxygenation. *Am. J. Roentgenol.* 117:509-516, 1973.
- Chow, C. K.; Hilal, S. K. and Niebuhr, K. E.
X-ray image subtraction by digital means. *IBM J. Res. & Dev.* 17:206-218, 1973.
- Edie, R. N.; Ellis, K.; Gersony, W. M. and Krongrad, E.
Surgical repair of single ventricle. *J. Thorac. & Cardiovasc. Surg.* 66:350-360, 1973.
- Ellis, K.
Angiographic evaluation of the right ventricular outflow tract in tetralogy of Fallot. *Circulation* 47:1080-1088, 1973.
Postoperative roentgen evaluation of total correction of tetralogy of Fallot. *Circulation* 47:1335-1348, 1973.
Resident's corner. *Medical Radiog. & Photog.* 49:23-26, 1973.
- Ellis, K.; Jaffe, C.; Malm, J. R. and Bowman, F. O., Jr.
Infective endocarditis—Roentgenographic consideration. *Radiol. Clin. North America* 11:415-442, 1973.
- Ellis, K. and King, D. L.
Pericarditis and pericardial effusion. Radiologic and echocardiographic diagnosis. *Radiol. Clin. North America* 11:393-413, 1973.
- Esser, P. D.; Atkins, H. L. and Robertson, J. S.
Rate of accumulation of technetium-99m by the thyroid. *Am. J. Roentgenol.* 118:827, 1973.
- Galloway, S. J.; Casarella, W. J. and Price, J. B.
Unilobar veno-occlusive disease of the liver: Angiographic demonstration of interlobar competition simulating hepatoma. *Am. J. Roentgenol.* 119:89, 1973.
- Galloway, S. J.; Casarella, W. J. and Seaman, W. B.
Non-operative removal of retained common duct stones. *Surg., Gynec. & Obst.* 137:55-58, 1973.
- Gross, W. and Colvett, R. D.
The biophysical properties of 3.9-GeV nitrogen nuclei. I. Dosimetry. *Radiat. Res.* 54:3-11, 1973.
- Hall, E. J.
Radiobiology for the Radiologist. Harper & Row, Hagerstown, Md., 1973.
In: *HZE Particle Effects in Manned Spaceflight.* D. Grahm, ed. National Academy of Sciences, Washington, D. C., 1973.
Radiobiology of heavy particle radiation therapy—Cellular studies. *Radiology* 108:119-129, 1973.
- Hall, E. J. and Kellerer, A. M.
The biophysical properties of 3.9-GeV nitrogen ions. III. OER and RBE determinations using Vicia seedlings. *Radiat. Res.* 55:422-430, 1973.
- Hall, E. J. and Lehnert, S.
The biophysical properties of 3.9-GeV nitrogen ions. IV. OER and RBE determinations using cultured mammalian cells. *Radiat. Res.* 55:431-436, 1973.
- Hall, E. J.; Rossi, H. H.; Kellerer, A. M.; Goodman, L. J. and Marino, S.
Radiobiological studies with monoenergetic neutrons. *Radiat. Res.* 54:431-443, 1973.
- Hilal, S. K.
Editor, *Small Vessel Angiography.* C. V. Mosby Co., St. Louis, Mo., 1973.
- Johnson, P. M.; Vaughan, E. D.; Beg, K.; Esser, P. D. and Laragh, J. H.
Quantitative dynamic renal imaging as a screening test for potentially curable hypertension. *Nuclear Med.* 14:628, 1973.
- Kellerer, A. M. and Rossi, H. H.
The biophysical properties of 3.9-GeV nitrogen ions. XI. Interpretation of results. *Radiat. Res.* 55:447-456, 1973.
- King, D. L.
Real-time cross-sectional ultrasonic imaging of the heart using a linear array multiple transducer probe. *J. Clin. Ultrasound* 1:196-200, 1973.
Placental migration demonstrated by ultrasonography. *Radiology* 109:167-170, 1973.
Real time cardiac ultrasonography: Use in evaluation of cardiac enlargement. *Circulation* 48:(IV):186, 1973.
Placental ultrasonography. *J. Clin. Ultrasound* 1:21-26, 1973.
Ultrasonography of echinococcal cysts. *J. Clin. Ultrasound* 1:64-67, 1973.
Cardiac ultrasonography. Cross-sectional imaging of the heart. *Circulation* 47:843-847, 1973.
- King, D. L.; Steeg, C. N. and Ellis, K.
Demonstration of transposition of the great arteries by cardiac ultrasonography. *Radiology* 107:181-186, 1973.
Visualization of ventricular septal defects by cardiac ultrasonography. *Circulation* 48:1215-1220, 1973.

- Loeb, J. N. and Borek, C.
Suppression of DNA in hepatoma cells exposed to hydrocortisone in vitro (Abstract). *Endocrinology* 92:(A-90), 1973.
- Mishkin, F. S. and Johnson, P. M.
The role of lung imaging in pulmonary embolism. *Postgrad. Med. J.* 49:487-502, 1973.
- Penn, R. D.; Hilal, S. K.; Michelsen, W. J.; Goldensohn, E. S. and Driller, J.
Intravascular intracranial EEG recording: Technical note. *J. Neurosurg.* 38:239-243, 1973.
- Potter, G. D.
Tomographic examination of the optic canal. *Medicamundi* 18:1, 1973.
Trauma of the ear. *Otolaryngol. Clin. North America* 6:401, 1973.
The hard palate. *Am. J. Roentgenol.* 118:415, 1973.
Sialography and the salivary glands. *Otolaryngol. Clin. North America* 6:509, 1973.
The ear, the surgeon and the radiologist. Hickey lecture. *Am. J. Roentgenol.* 118:501, 1973.
- Pressman, B. D.; Asch, T. and Casarella, W. J.
Cystadenoma of the pancreas. *Am. J. Roentgenol.* 119:115, 1973.
- Reilly, J. A. and Johnson, P. M.
Rapid skeletal imaging using ^{18}F and a diverging collimator. *Radiology* 107:373-375, 1973.
- Renert, W. A.; Berdon, W. E. and Baker, D. H.
Hemorrhagic cystitis and vesicoureteral reflux secondary to cytotoxic therapy for childhood malignancies. *Am. J. Roentgenol.* 117:664-669, 1973.
- Rodgers, R. C.; DiCello, J. F. and Gross, W.
The biophysical properties of 3.9-GeV nitrogen nuclei. II. Microdosimetry. *Radiat. Res.* 54:12-23, 1973.
- Rossi, H. H.
Radiation quality and its biomedical implications. In: *Proc. Conference on Particle Accelerators in Radiation Therapy*, October 1972. Los Alamos Scientific Laboratory, LA-5180 C:93-96, 1973.
- Rossi, H. H.; Hall, E. J. and Kellerer, A.M.
Biophysical factors in brachytherapy with low and high LET radiations. *Radiology* 107:645-649, 1973.
- Rugh, R.
X-rays and the retina of the primate fetus. *Arch. Ophthalm.* 89:221-227, 1973.
- Srdoc, D.
Dependence on the energy per ion pair on the photon energy below 5 keV in various gases. *Nuclear Instr. & Methods* 108:327-332, 1973.
- Steeg, C.; Ellis, K. and Gersony, W.
Total anomalous pulmonary venous drainage with ventricular septal defect. *Am. Heart J.* 86:341-346, 1973.
- Stiehm, W. D. and Seaman, W. B.
Roentgenographic aspects of primary carcinoma of the appendix. *Radiology* 108:275-278, 1973.
- Underbrink, A. G.; Schairer, L. A. and Sparrow, A. H.
The biophysical properties of 3.9-GeV nitrogen ions. V. Determinations of the relative biological effectiveness for somatic mutations in *Tradescantia*. *Radiat. Res.* 55:437-446, 1973.
- Tradescantia stamen hairs: A radiobiological test system applicable to chemical mutagenesis. In: *Chemical Mutagens: Principles and Methods for Their Detection*, vol. 3. Plenum Press, New York, 1973, pp. 171-207.
- Underbrink, A. G.; Sparrow, A. H.; Pond, V.; Takahashi, C. S. and Kappas, A.
Radiation induced pollen abortion in several Comelinaceous Taxa: Its relation to chromosomal parameters. *Radiat. Botany* 13:215-227, 1973.
- Waldron, R. L. II; Bridenbaugh, R.; Purkerson, M. and Dempsey, E. W.
The effects of angiographic contrast media at the cellular level in the brain. *Radiology* 108:197-189, 1973.
- Waldron, R. L., II; Kenny, G. and Sorger, K.
Liver-cell carcinoma presenting as bile-duct tumor. *Brit. J. Radiol.* 46:195-197, 1973.

Rehabilitation Medicine

BERNARD SCHOENBERG

Acting Chairman of the Department

June 30, 1973 marked the retirement of Dr. Robert Croly Darling, Professor and Chairman of the Department of Rehabilitation Medicine since 1952, the year the Department was instituted, and Simon Baruch Professor since 1961. Under Dr. Darling's administration, the Department has steadily grown, research laboratories have been founded and expanded, and patient care has been greatly enlarged through the establishment of an inpatient service as well as expanding clinic and consultation services. Dr. Darling is continuing activities in teaching, research, and patient care, for which the Department is grateful. Dr. Bernard Schoenberg, Associate Dean for Allied Health Affairs, is currently Acting Chairman of the Department.

In a departure from previous policy, the Rehabilitation Medicine Elective Program was made available to a medical student upon completion of his freshman year. The student participated in a research project and clinical rounds and is preparing a clinical report which is to be submitted for publication.

Dr. Derek B. Frewin, from the Department of Human Physiology and Pharmacology, University of Adelaide, South Australia, was Visiting Associate Professor until August 1973. He and Dr. John A. Downey, with Drs. Stanley Myers and Charles Huckaba of this Department and Drs. Kenneth Eakins (Ophthalmology), Lawrence Levitt (Psychiatry), and Carwile Leroy, David McConnell, and Andrew Frantz (Medicine) conducted research on various aspects of the control of circulation. Drs.

Huckaba and Downey continued their research on the regulation of body temperature, particularly during eating, and the control of sweating. Drs. Huckaba and Downey, with Dr. Lucien Cote (Neurology), also studied the vascular responses of patients with Parkinson's disease. With Dr. Linda Lewis and others in the Department of Neurology, Drs. Huckaba and Downey studied vascular responses in patients with migraine. Drs. Myers, Frewin, and Downey studied the vascular hormonal responses of paraplegic patients in tilting.

A two-year grant was received to investigate the physiological effects of acupuncture. The studies are currently being organized and will include the effects of acupuncture on blood flow and release of sympathetic chemical mediators. Plans are also under way to revise the electrodiagnostic unit on the 8th floor so that measurements of cerebral evoked potentials can be recorded. This will be of value in the management and determination of the prognosis of patients with spinal injuries, as well as in research.

Continuing the trend set in previous years, the patient load, both inpatient and outpatient, has increased. There are approximately 300 occupational therapy treatments per month and approximately 1400 physical therapy treatments per month given in Vanderbilt Clinic.

The Department gratefully acknowledges the generous support of Mr. Charles Lachman for research in acupuncture, of an anonymous donor for a continuing grant, and of other donors.

Occupational Therapy Courses

Miss Stephanie Presseller, Associate Professor of Occupational Therapy, has tendered her resignation to become the organizing director of a new occupational therapy curriculum at Hunter College.

Mrs. Adelaide Deutsch, Associate Director of Occupational Therapy, served as Curriculum Consultant at the Hadassah Medical School, Mt. Scopus, Jerusalem, in August 1973 and also visited community service agencies in both Jerusalem and Tel Aviv.

Professor Marie Louise Franciscus, Director of Occupational Therapy Courses, attended the spring education meetings of the American Occupational Therapy Association as a member of the Curriculum Advisory Committee and the Education Council and served as a member of a curriculum survey team at the University of Illinois College of Medicine. She continues to serve as an Advisory Fellow of the World Federation of Occupational Therapists and as a consultant to the International Committee of the American Occupational Therapy Association.

There have been two developments this year in the courses on the Treatment of Physical Dysfunction for Master's students. A workshop entitled "Neurophysiological Approach to Treatment" was organized in the spring of 1973 by Miss Barbara Neuhaus, Instructor in Occupational Therapy, and the second year Master's students. Beginning in the autumn term, Miss Neuhaus is conducting her course for students at Jacobi Hospital and Lubin Rehabilitation Center of the Albert Einstein Medical Center. We are indebted to these two institutions for providing teaching resources to make this arrangement possible.

The program in Occupational Therapy has been supported in part by a grant from Social and Rehabilitation Services of the Department of Health, Education, and Welfare. The project, initiated in 1972-73 and continued in 1973-74, has included a course offering in Supervision each year for graduate students.

The entering Juniors (13) and Master's degree candidates (18) in 1973 were selected from 94 applicants; these 31 new students joined 23 second-year students for a total of 54. Twenty-six were awarded degrees in 1973: 9, the B.S. and 17, the M.S.

Courses in Physical Therapy

The program continued efforts to seek closer cooperation and interaction with other departments on the Health Sciences and Morningside Campuses.

Promotions in the faculty included those of the

Misses Ruth Dickinson and Althea M. Jones—to Associate Professor—and of Miss Mary E. Callahan—to Professor of Physical Therapy.

Inquiries about the program in Physical Therapy have increased, continuing the trend of the late 1960's. During the first three years of this decade the number of applications has quadrupled.

Professor Dickinson was project director for an Allied Health Special Project Grant (N.I.H.) titled "Designing Learning Activities to Meet the Objectives of Physical Therapy Clinical Education." The project resulted in a publication which has been distributed nationally to physical therapy programs.

Miss Bernadette Hecox, Associate in Physical Therapy, with an extensive background of experience in dance and physical therapy, is frequently called upon for lectures and demonstrations, to review films and books, and to act as a consultant. These activities have taken her to the Hudson Valley Chapter of the A.P.T.A., Downstate Medical College, Old Dominion University in Norfolk, Virginia, and a Senior Citizens group in Riverdale. Miss Hecox is a consultant for a film being developed on "Body Mechanics" and another film entitled "Exercises for People over Forty." She continues to work at St. Luke's and Presbyterian Hospitals with groups of disabled adults as part of a study to evaluate the effects of dance therapy on the adult patient.

Professor Althea Jones participated in a five-day workshop at the University of Puerto Rico and a two-day workshop for the Valley Hospital Association, Ridgewood, New Jersey. She has also been active in in-service training programs in the Metropolitan, New York, and Presbyterian Hospitals and continues to serve as a consultant to the Physical Therapy staff in the Presbyterian Hospital.

Professor Ruth Dickinson served as a consultant to a developing physical therapy assistants' program at Fairleigh Dickinson University. Professors Callahan and Dickinson continue to serve as team leaders on curriculum survey visits for the accreditation of education programs in physical therapy. This is a joint venture with the Council on Medical Education of the American Medical Association.

During the past year Professor Callahan served as regional consultant to the Social and Rehabilitation Service Educational Grants program of H.E.W. and to the Panel on Stroke of the New York Metropolitan Regional Medical Program.

The generous contribution to the education of physical therapists by Mrs. Julia T. Weld, in honor of Mr. Gote P. Philips, Physical Therapist and former member of the Presbyterian Hospital staff, is deeply appreciated.

Harlem Hospital

The Department has encouraged broad staff participation in teaching and training programs in addition to regularly scheduled staff activities. All sections of the Department provided didactic and clinical experiences for the first class of students in the Physician's Associate program during their two-week rotation in Rehabilitation Medicine.

Mrs. Margaret Brown, Instructor in Occupational Therapy, lectured on the Treatment of the Burned Patient to the rehabilitation staff of Metropolitan Hospital and Columbia University Occupational Therapy graduate students.

Two hundred high school students of the Bio-Medical Careers Program sponsored by the Brooklyn Medical Committee for Human Rights made their annual visit to the Department. Representatives of each section were on hand to conduct tours and answer questions related to career opportunities in Rehabilitation Medicine, and a movie produced in the department, "Rehabilitation and the Physically Impaired," was shown.

The teaching affiliations of the several sections of the Department have increased substantially. Occupational and Physical Therapy provided clerkships for graduate and undergraduate students from Columbia University, Hunter College, Downstate Medical Center, New York University, and the University of Pennsylvania. Vocational Counseling accepted two vocational rehabilitation interns from Hunter College. The Nursing section of the department continues to provide teaching for Harlem Hospital School of Nursing, Manhattan Community College, and the Master's Program of New York University. Residents from the Departments of Rehabilitation Medicine and Orthopedics of the Presbyterian Hospital and the Department of Pediatrics of Harlem Hospital Center rotate through the department. Weekly teaching sessions with medical students assigned to the Department of Neurology have become a regular departmental activity.

Preliminary patient care statistics seem to confirm the trend noted last year: That is, services to inpatients at this institution may have reached a plateau at an anticipated level, according to national figures. Meeting outpatient needs presents a crucial problem. The greatest current need in this area is adequate follow-up of the multiply and severely impaired individual such as the patient with an injured spinal cord. Preliminary to meeting this need and projecting a more meaningful extension of our activities into the community, both for diagnostic and therapeutic purposes, adequate nursing staff and space are required.

The Social and Rehabilitation Service (SRS) Grant to follow patients discharged into the community terminates this year. Funds are being sought to incorporate significant project findings into the departmental activities.

New York State Rehabilitation and Research Hospital

Dr. Morton Hoberman, Clinical Professor and Senior Consultant in Rehabilitation Medicine, retired in July after 25 years of service in this hospital. Dr. Hoberman will continue as a Senior Consultant and Clinical Professor at Columbia University. Dr. Cayetano Co resigned as Attending Physiatrist for the Spinal Cord Injury Unit but will continue as a consultant. Drs. Alfred Hess and Sally Wisely joined the staff as Attending Physiatrists.

The teaching program has been expanded to include student nurses from various community colleges who are given a six-week orientation program in the principles and practice of rehabilitation nursing.

Renovations of the Research Building were recently completed and the areas affected are now in use. Research in biomechanics, biochemistry, and neuromuscular and cardiovascular studies is currently being conducted.

St. Luke's Hospital

Dr. Ravi Malpe has been promoted to Assistant Attending Physiatrist as of October 1973.

A two-year research project in acupuncture was started in September 1973 at the Rehabilitation Medicine Service under the direction of Dr. Shyh-Jong Yue and with the assistance of Drs. Lucille Pai and Alfred Peng. The purpose of this project is to evaluate the therapeutic effect of acupuncture for the relief of pain and improvement of function of patients with selected musculoskeletal disorders.

In addition to the Dance Therapy program under the direction of Miss Bernadette Hecox, an additional dance project in cooperation with the Arthritis Clinic is being conducted by Mrs. Virginia Stillman, Occupational Therapist, Home Care Service, and Miss Jewel Derin, Physical Therapist, Rehabilitation Medicine Service. Mrs. Stillman and Miss Derin presented a paper on their study to the National Arthritis Foundation in Los Angeles in June. Major donors to the Acupuncture Research Project were the Surdna Foundation and the Irma Hershel Fund.

Roosevelt Hospital

Dr. Raul P. Sala resigned his position as Assistant Director of the Department of Rehabilitation Medi-

cine. In the patient care areas, occupational, physical, and recreational therapy were added to the Geriatric Day Care Program, and a Visual Perceptive Testing Program was activated by the Occupational Therapy section.

Blythedale Children's Hospital

Following his retirement as Chairman of the Department of Rehabilitation Medicine of the College of Physicians and Surgeons, Dr. Robert C. Darling began working with the Blythedale Administration on computer-based scheduling and records.

For the second year Blythedale has hosted a sum-

mer clerkship sponsored, for an eight-week period, by the United Cerebral Palsy Research and Educational Foundation, Inc. Mr. Cornelius Flowers, a second-year student of the College of Physicians and Surgeons, was this year's fellow. His program was supervised jointly by the Departments of Pediatrics and Rehabilitation Medicine.

Dr. Yasoma Challenor participated in the program of the annual meeting of the President's Committee for Employment of the Handicapped, Washington, D. C., May 1973, presenting to a panel of senators "Legislative Measures Relating to Employment of the Handicapped."

1973 Publications

Rehabilitation Medicine

Alba, A.; Lee, H. M. and Malpe, R.

Rehabilitation technics in polymyositis. *New York J. Med.* 73:1208-1210, 1973.

Challenor, Y. B.; Richter, R.; Pearson, J.; Brown, B. and Baden, M.

Non-traumatic plexitis and heroin addiction. *J.A.M.A.* 225:958-961, 1973.

Chu, L.; Garrett, A.; Leahey, E. and Reyes, R.

The clinical study of eighty-six lower extremity amputees emphasizing the use of modular unit prothesis. *New York J. Med.* 73:1186-1188, 1973.

Cunningham, D. J.; Downey, J. A. and Huckaba, C. E.
Behavioral thermoregulatory responses following changes in core temperature, without parallel displacement in peripheral sensory input. *Int. J. Biometeorol.* 16:43-44, 1972.

Dickinson, R.; DiMarino, J. and Pfitzenmaier, J.

A common evaluation instrument. *Phys. Ther.* 53: 1075-1080, 1973.

Downey, J. A. and Frewin, D. B.

The effect of cold on blood flow in the hand of patients with Raynaud's phenomenon. *Clin. Sc.* 44:279-289, 1973.

Downey, J. A.; Huckaba, C. E.; Myers, S. J. and Darling, R. C.

Thermoregulation in the spinal man. *J. Appl. Physiol.* 34:790-794, 1973.

Frewin, D. B.; Levitt, M.; Myers, S. J.; Co., C. C. and Downey, J. A.

Catecholamine responses in paraplegia. *Paraplegia* II:238-244, 1973.

Frewin, D. B.; McConnell, D. J. and Downey, J. A.

Is a kininogenase necessary for human sweating? *Lancet* 2:744, 1973.

Huckaba, C. E.; Downey, J. A. and Darling, R. C.

An elucidation of the separate effects induced by central and peripheral sensors in human thermoregulation. In: *Chemical Engineering in Medicine*. American Chemical Society, Washington, D. C., 1973, pp. 256-267.

Huckaba, C. E.; Downey, J. A.; Darling, R. C. and Hansen, L. W.

The calculation of temperature distribution in the human body (Abstract). *Fed. Proc.* 31:399, 1972.

Constraints in the simulation of physiological systems. *Proc. 25th Ann. Conf. Eng. in Med. & Biol.*, Bal Harbour, Fla., 10/72.

Myers, S. J.

The spinal injury patient. In: *The Child With Disabling Illness: Principles of Rehabilitation*. J. A. Downey and N. Low, eds. W. B. Saunders, Philadelphia, 1973, pp. 93-129.

Thornhill, H. L.; Richter, R.; Shelton, M. and Johnson, C.

Neuropathic arthropathy (Charcot forefeet) in alcoholics. *Orthoped. Clin. North America* 7:20, 1973.

Surgery

KEITH REEMTSMA

Professor and Chairman of the Department • Director of Service

This year marked the expansion of several of our clinical and research programs and the strengthening of our faculty. Dr. Paul LoGerfo has been appointed Assistant Professor of Surgery. Dr. LoGerfo has made numerous contributions in the area of cancer research, and he brings to our Department strength, both in basic and in applied techniques for the understanding and management of cancer. Dr. Thomas C. King, formerly Professor of Surgery and Provost at the University of Utah, has joined our faculty as Professor of Surgery. Dr. King, who is one of the nation's leaders in medical education, joins our faculty to co-ordinate our expanding program in trauma and emergency care and also to aid in developing new programs in education.

Dr. Denis F. J. Halmagyi has joined our faculty as Associate Professor of Physiology (in Surgery). Dr. Halmagyi, formerly on the faculty of the University of Sydney, has worked with our staff in the new Intensive Care Unit. He now joins our full-time faculty to help our clinical and research efforts in the care of injured patients.

Dr. Nicole Suciu-Foca has been appointed Assistant Professor of Experimental Pathology (in Surgery). Dr. Suciu-Foca has worked extensively in the field of immunology, and recently she has pioneered in the application of newer immunologic technics to problems in transplantation and cancer.

This report summarizes the year's activities in our clinical, research, and educational programs.

Teaching

The Department's Teaching Committee, under the chairmanship of Dr. Philip D. Wiedel, has been responsible for the organization of undergraduate and graduate educational programs.

Undergraduate

Dr. Alfred Jaretzki III, continued to coordinate the departmental contributions to the teaching of Anatomy in the first year. He organized a series of correlation clinics in which members of the Departments of Surgery, Orthopedics, and Urology present illustrative clinical cases in coordination with laboratory dissections. In addition, members of the Department have participated in teaching in the dissecting rooms on a regularly scheduled basis.

For the third semester, Dr. Wiedel organized the Department's participation in the teaching of history-taking and physical examination in the course entitled "Introduction to the Patient." This teaching has been done at Presbyterian, Delafield, Harlem, Roosevelt, and St. Luke's Hospitals. An introductory course dealing with local and systemic responses to injury and the processes of repair also has been directed by Dr. Wiedel.

The teaching in the major clinical year has continued to be coordinated by Dr. Robert G. Bertsch. Increased utilization of semiprivate and private patients for undergraduate teaching has been greatly facilitated by the current organization of the service into three teams composed of attending surgeons,

residents, and interns caring for all categories of patients. During their six-week surgical clerkship students are assigned to one of these teams, in groups of five or six, and take an active part in the diagnosis and treatment of patients under the direction of their preceptor and of the house staff. This clinical experience is supplemented by didactic teaching sessions in Surgical Pathology and by seminars in Oncology, Thoracic Surgery, and Radiology.

Dr. Frank E. Gump has been responsible for the elective program. Surgical subinternships at Presbyterian and affiliated hospitals have continued to be chosen extensively by the students. Some students have chosen subinternships at other University hospitals. The course in Surgical Anatomy and Technique was again directed by Dr. Shivaji B. Bhonslay with the assistance of members of the Department of Anatomy. The course was fully subscribed and met with an enthusiastic reception by the students. A number of students also spent elective periods in the research laboratories of members of the Department and in the Division of Surgical Pathology.

Graduate

The house staff teaching program, organized by the House Staff Committee under the chairmanship of Dr. Richard Weil, III, is accomplished by many different teaching techniques, including postgraduate courses, lectures, conferences, research seminars, and unscheduled clinical teaching sessions. Each year the program graduates five residents who are eligible for examination by The American Board of Surgery. In addition, postgraduate clinical training programs are offered in pediatric surgery, plastic surgery, thoracic-cardiovascular surgery, and vascular surgery. A fellowship in surgical gastroenterology was offered for the first time in 1973. The Surgical Scientist Program, sponsored by the National Institutes of Health, has been discontinued throughout the United States by the Federal Government.

Postgraduate

Our Department's postgraduate educational program now is coordinated by Dr. Jose Ferrer who also serves as Associate Dean for Postgraduate Education.

A three-day postgraduate course entitled "Physiology and Metabolism of Intensive Care" was given in March under the direction of Drs. John M. Kinney and Gump and attracted a capacity attendance of 195.

A five day course on "Recent Advances in General Surgery" was also given in March at St. Luke's Hospital Center under the direction of Dr. Hugh F. Fitzpatrick. This course attracted 42 students.

Research

Surgical Metabolism

The Surgical Metabolism Program, under the direction of Dr. Kinney, continued research in several areas, particularly in the exploration of carbohydrate and nitrogen metabolism, gas exchange, and cardiopulmonary alterations following injury and sepsis.

Previous studies on glucose intolerance following operation and injury were extended by Drs. Gump and Calvin Long. It is increasingly clear that the liver plays a central role in glucose intolerance. Continued hepatic glucose production appears to be more important than abnormal peripheral utilization of this substrate. This problem has been studied using ^{14}C alanine and regional catheterization. Each method has demonstrated that the rate of gluconeogenesis from amino acids continues at a high rate during injury and sepsis despite the administration of exogenous glucose, which would nearly abolish this reaction in a normal subject. Dr. Gump initiated collaboration with Dr. Philip Felig of Yale Medical School to examine the ratio of insulin to glucagon in portal blood obtained through catheterization of the umbilical vein at the time of laparotomy. Since the balance of these pancreatic hormones may exert a primary influence on gluconeogenesis in the liver, it is expected that hormone measurements in the portal blood will be of greater significance than measurements in peripheral blood.

Drs. Long and Malayappa Jeevanandam extended their studies with ^{15}N alanine to determine whether it is possible to measure changes in the relative rates of overall protein synthesis and breakdown in the surgical patient. Any mathematical model for the interpretation of such data requires estimates of the dynamics of urea, as well as free amino acids. These investigators extended our knowledge of human urea metabolism by new data indicating the extent of recycling of nitrogen which can occur as a result of intestinal bacteria. It is commonly assumed that the protein loss which characterizes the response to injury and infection is largely at the expense of muscle protein stores. Our understanding of this process requires knowledge of the behavior of free amino acids in muscle, which has been poorly estimated by measurement of circulating amino acids in the past. Drs. Erik Vinnars and Peter Fürst are joining our program this year from St. Erik's Hospital in Stockholm. They are introducing a sophisticated technique for measuring free amino acids in human muscle obtained by needle biopsy.

The subject of nitrogen loss is also being pursued by collaborative research with Dr. Hamish Munro

and co-workers at M.I.T. This involves measuring the excretion rate of the unique amino acid, methylhistidine, which is a component of muscle protein, but which when released upon protein breakdown cannot be reutilized for synthesis. It is possible that measurement of its excretion rate may offer specific evidence of the rate of muscle protein breakdown.

Mortality due to major sepsis continues to be high and demands better understanding of the interaction between tissue energy demands and cardiopulmonary adaptations to provide for these increased demands. Dr. Halmagyi undertook an extensive review and computer analysis with Mr. John Broell of the possibility of predicting metabolic expenditure from a knowledge of body temperature and pulse rate. This study, involving data from more than 1,300 patient-days on the Surgical Metabolism Unit, revealed that:

a. Tachycardia often occurs in the absence of either fever or hypermetabolism.

b. Hypermetabolism at normal temperature occurred in the more severely ill, and these patients were benefited less by antipyretic drugs.

c. It is impossible to identify, from studies during the febrile state, the particular patients who would have hypermetabolism even at normal body temperature.

Thus, the effort to predict energy metabolism in acute surgical conditions from a knowledge of vital signs is not reliable and may on occasion be seriously misleading.

Drs. Elliott Bader and Richard Gusberg completed studies in which the increased resting oxygen consumption that occurs with rapid infusion of amino acids was examined in the light of increases in oxygen consumption and circulatory requirements. Evidence from these studies indicated that the extra heat production associated with nitrogen metabolism accounted for less than half of the measured increases in caloric expenditure in acute surgical conditions. In addition, the increased cardiac output commonly associated with septic conditions may in part provide extra heat transport beyond the circulatory requirements for oxygen transport.

Dr. Peter Scholz is continuing his work in collaboration with Dr. Shu Chien (Physiology) to identify surgical conditions in which altered red cell metabolism and cell rigidity may contribute to abnormal patterns of blood flow and gas transport.

A collaborative study is being initiated among Drs. Henrik Bendixen (Anesthesiology), and Raymond Laravuso (Anesthesiology), and Halmagyi, with Dr. Bang Mo Kim and Mr. John Broell, to utilize multiple inert tracers with varying aqueous solubilities as a means of quantitating the balance

between ventilation and perfusion in the lung.

Bioengineering graduate students pursued studies in association with the Surgical Metabolism Program under the sponsorship of members of the engineering faculty. One such project was completed by Mr. Alan Woodward with Drs. Mary Anne Farrell and Neil Kavey (Chemical Engineering, Psychiatry). The project involved a new and simplified approach to computer analysis of EEG and eye movement signals to determine the duration of sleep at different levels in a clinical environment. It is hoped to extend this type of study to elective surgical patients and eventually to acute surgical patients requiring intensive care.

Cardiovascular and Pulmonary Surgery

Dr. James R. Malm, Director of the Chest Surgical Service, and his associates, Drs. Bowman, Beach, and Edie, continued their collaboration with members of the Departments of Pharmacology (Drs. Brian F. Hoffman and J. Coopersmith), Anesthesiology (Drs. Stuart E. Sullivan and Richard W. Patterson), Psychiatry (Drs. Donald Kornfeld and Stanley Heller), and Pediatrics (Drs. Welton Gersony, Constance Hayes, and Ehud Krongrad) in a group of interrelated clinical and basic research projects dealing with the heart and lungs.

Drs. Hoffman and Malm are co-investigators, with Drs. J. Thomas Bigger and S.-C. Wang, of a program project grant from the National Institutes of Health to develop basic techniques in electrophysiology and pharmacology into improved patient management. Included among these are precise methods for identifying specialized intracardiac conduction pathways, cardiac pacing techniques to control cardiac arrhythmias and improved methods of computerized on-time measurements of causes of postoperative aberrant conduction (Drs. Krongrad and Coopersmith). Direct myocardial cell measurements are being made of abnormal human cardiac muscle to measure change in transmembrane action potential by Drs. Alan Spotnitz and Harry Bush. Dr. Henry Spotnitz, continuing his interest in myocardial performance and rectus muscle structure, investigated the use of skeletal muscle as a supplemental power source for circulatory support. Dr. Bregman initiated a clinical and research program for circulatory support with the intraaortic balloon pump. Dr. Richard Pooley has been investigating the mechanisms by which counterpulsation improves hemodynamics. Dr. Merker completed a study of the pressure-flow patterns of human coronary arteries following saphenous vein bypass graft with Dr. Reemtsma, and Dr. Parodi investigated the structural characteristics of

human veins to identify the optimal sources of grafts for bypass procedures and the hemodynamics of the coronary circulation.

A prospective study on psychometric evaluation of patients undergoing heart surgery was completed by Drs. Kornfeld and Heller. A new project will concentrate on psychological and psychometric parameters of patients undergoing coronary artery surgery for angina pectoris.

Drs. Gersony and Hayes continue a collaborative program in the management of infants requiring cardiac surgery within the first six months of life.

Drs. Edie, H. Spotnitz, and Truccone have been performing studies on ventricular function and response to cardiac surgery on puppies. In addition, Drs. Malm and Truccone have been studying the cardiac output response to open heart surgery in the infant and, with Dr. Pooley, are carrying out oxygen consumption studies on infants during heart surgery.

Cancer and Cell Physiology

Dr. LoGerfo, working with Dr. Sydney Bennett in the Surgical Laboratories of the Institute of Cancer Research, continued investigations of tumor antigens and related immunological phenomena. The Zirconyl Phosphate Gel assay for circulating tumor-associated antigen (TAA) appears to be of some value in diagnosis and prognostic evaluation of cancer patients, but there are definite limitations to its use as a screening procedure. Elevated circulating TAA is suggestive of neoplasm but gives no information as to its location; very high levels point strongly to advanced or metastatic disease. Some patients fail to demonstrate elevated serum TAA levels although extracts of their tumors are positive by assay. *In situ* localization with anti-TAA serum may provide a specificity which is now lacking. With Dr. K. C. Hsu the three-layer bridge immunoperoxidase technique is being used by Drs. LoGerfo and Bennett for antigen localization in cancers of the colorectum, lung, breast, cervix, bladder and prostate, results being correlated with the Z-Gel radioimmunoassay for TAA in plasma and tissue extracts of patients.

One hundred and fifty patients with nonmetastatic colorectal cancer have been followed for periods of 24-36 months postoperatively. Preoperative TAA values (it appears that TAA is identical with Gold's carcinoembryonic antigen or CEA) appear to correlate with the extent of the disease and the prognosis. The expectancy for recurrence is 1.8 times higher in individuals with elevated preoperative TAA levels than in those with normal levels.

Dr. LoGerfo and his colleagues developed an extremely sensitive radioimmunoassay for mouse mam-

mary tumor virus (MTV) and are currently studying its activity in human breast diseases. Approximately 30 per cent of plasmas from human breast cancer patients were positive using this assay, as were 75 per cent of breast cyst fluids. The significance of these data is now being evaluated.

Dr. Duncan McCollester, also working in the Institute of Cancer Research, has pursued his studies of the antigenic properties of tumor cell surface membranes. The rejection rate of established Meth A transplantable tumors in BALB/c mice and spontaneous breast carcinoma in Paris RIII mice by immunizing with surface membranes isolated from the respective tumors has been increased from 20 per cent to 40 per cent as a consequence of further modifications in the membrane isolation procedure.

Dr. Nicole Suci-Foca made provocative observations concerning the cellular and humoral immune responsiveness of patients with cancer. Cellular responsiveness, as measured by lymphocyte transformation in one-way MLC and in PMA-stimulated cultures, was evaluated in 92 cancer patients and 81 normal controls; T-cell responsiveness was significantly lower in the cancer patients than in the controls. Lymphocyte reactivity in the presence of autologous cancer serum was inversely related to the extent of the disease. A positive correlation was shown between serum inhibitory activity, anti-ML-A antibody activity, and circulating levels of TAA, and attempts are now being made to further isolate and characterize these inhibitory factors in cancer sera. Dr. Suci-Foca is also studying the effects of MTV (mammary tumor virus) on cellular immune responsiveness; preliminary data would indicate that MTV interferes with *in vitro* activation of T-lymphocytes, and that this inhibition is neutralized by sera from patients with early or cured breast cancer.

Dr. David V. Habif has recently launched a clinical trial of human interferon in breast cancer; it is far too early to present even tentative observations. Drs. Sven J. Kister and Cushman D. Haagensen continue their analysis of "high-risk" groups in carcinoma of the breast, with new and special emphasis on gross cystic disease. With Dr. Hans J. Hansen and Darrow E. Haagensen, Dr. Kister studied the significance of CEA serum levels in 128 female patients with breast disease. Values greater than 5 ng/ml were not found in those with benign diseases or in patients with Stage A and B breast cancer (Columbia Clinical Classification). Elevations were present only in advanced metastatic disease. Drs. Kister and William Dilley (Anatomy) pursue their collaborative effort to determine the effects of various hormones and chemotherapeutic agents on organ

cultures of human breast cancer. With Dr. Robert DeBellis (Medicine), Dr. Kister established therapy protocols for certain stages of breast carcinoma. Drs. Charles A. Slanetz, Jr. and Frederic P. Herter are approaching completion of their analysis of over 5,000 cases of colorectal cancer treated since 1915 at the Medical Center. Dr. David M. C. Ju completed a study on the etiology of lip cancer. Dr. Thomas V. Santulli continues to direct the Pediatric Combined Tumor Clinic and to collaborate with Dr. James Wolff on joint chemotherapy programs. Dr. Herter has been named Director of the Therapy Section of the newly established Cancer Research Center and sits on the Scientific Advisory Committee of the Center.

Drs. Gordon Kaye, Nathan Lane, Robert Pascal and Cecelia Fenoglio continue to study the nature and dynamics of the epithelio-mesenchymal interface in the intestinal mucosa. This work is being done in the F. Higginson Cabot Laboratory of the Division of Surgical Pathology. With Dr. Ralph Richart they are carrying out correlated transmission and scanning electron microscopic studies of adenomas and adenocarcinomas of the colon. Dr. Kaye also continued his studies on the nature, function, and variability of the corneal endothelial carrier in the maintenance of normal corneal hydration and collaborated with investigators at the University of Geneva in the electron microscopic study of soft-tissue tumors. Drs. Marianne Wolff and Karl H. Perzin are both pursuing clinicopathological studies of various tumor entities, and Dr. Virginia LiVolsi is continuing work begun a year ago on the immunohistochemical localization of calcitonin in the parafollicular cells of the human thyroid, and with Drs. Carl Feind and LoGerfo is studying C-cell function in thyroid disease, hyperparathyroidism, and hypercalcitoninemia associated with neoplastic disease. Recently this group began investigating the physiological and pathophysiological relationships among calcitonin, parathormone, and gastrin, trying to elucidate the significance of the association between peptic ulcer disease and hyperparathyroidism, and between hypercalcitoninemia and the Zollinger-Ellison syndrome.

Wound Healing

In addition to the development of topical creams and sutures of the pure chemical wound healing accelerator (polymeric N-acetyl glucosamine or Poly-NAG) which was reported last year, nonwoven fabrics were made during the past year which can be applied between the opposing edges of wounds or applied to wound surfaces as a unit. The wound

fluid lysozyme then slowly depolymerizes the polymer, releasing the monomeric form to accelerate healing at the site of its release. This new material is under study for use as bandages, operative sponges, or dressings.

An extract of cartilage, CATRIX, was shown to possess anti-inflammatory properties which are more powerful in some circumstances than those of standard corticosteroids; in addition, CATRIX lacks the latter's undesirable and sometimes dangerous side effects. Further work is being done to elucidate the mechanism of these effects. As noted in last year's report, it is believed that CATRIX acts as a competing but nonspecific antigen which combines with autoantibodies into a nonpathogenic antigen-antibody complex.

Hepatic Regeneration

Work carried out last year in dogs showed that glucagon and insulin are portal factors that have important roles in modifying hepatic regeneration. The technique of maintenance of rats without portal organs by hyperalimentation was achieved. Studies in these animals with partial hepatectomies confirmed regulatory roles for glucagon and insulin in the regenerative processes. Glucagon and insulin thus appear to be hepatotrophic substances and may offer a pharmacologic means of controlling the hepatic atrophy seen in a variety of clinical hepatic diseases.

Transplantation

During the past year the Columbia Kidney Transplantation Program grew in volume and scope. Drs. Reemtsma and Weil began to perform kidney transplants at Presbyterian and Babies Hospitals, with the support of the Presbyterian Hospital Hemodialysis Unit, under the direction of Drs. John Laragh, Ginette Jacob, Julio Sotelo, and Gail Williams. Both pediatric and adult dialysis and transplantation are being carried out at Presbyterian and Babies Hospitals. The permanent Dialysis and Transplantation Center is now under construction on PH 4-C with occupancy projected for 1975. Drs. Reemtsma, Weil, and Weber are working in the laboratory with new immunosuppressants and with methods of transplanting the endocrine pancreas. Some of this research work has been done in collaboration with Dr. McIntosh (Pediatrics).

At Delafield Hospital Drs. Lattes, Buda, and Price continued to enlarge the clinical kidney transplantation program. Drs. Suciu-Foca and Buda have been actively studying the relationships between serologically dependent and cell dependent histocompatibility markers, particularly as expressed by blast cell

count and mixed lymphocyte cultures. This laboratory also provides clinical tissue typing information for the clinical kidney transplantation program.

At St. Luke's Hospital, Drs. Stevens, McCabe, and Lattes expanded the Columbia Organ Procurement and Preservation Laboratory. This laboratory provided the Columbia and other metropolitan hospitals with a significant number of well-preserved cadaver kidneys for transplantation. A tissue typing laboratory has recently been opened at St. Luke's Hospital. Drs. Stevens, McCabe, and Lattes increased the St. Luke's Hospital group of recipients waiting for cadaver kidneys; this list now includes patients on hemodialysis at Harlem Hospital.

The Columbia Transplantation Program is continuing to develop in a coordinated manner at these several hospitals in order to provide care for patients with end-stage renal disease and in order to accumulate significant clinical and investigative information.

Plastic Surgery

Sponsored by the Educational Foundation of the American Society of Plastic and Reconstructive Surgeons, Inc., a symposium on the Treatment of Burns was presented in the Alumni Auditorium December 6-8, 1973. Drs. George F. Crikelair, Bard Cosman, and Bertram Bromberg, Professor of Surgery at Downstate Medical Center, chaired the symposium.

The Division of Plastic Surgery with Dr. Melvin Moss (Anatomy, Dental and Oral Surgery) initiated a program of resident research for six months prior to beginning the plastic surgery residency. Work now in progress includes neurogenic aspects of wound healing, denervation of salivary glands, and nerve-to-muscle implants.

Clinical research projects involving residents and attending staff include: electrical burns of the mouth,

melanomas, keratoacanthoma with perineural involvement, flammable fluids and clothing burns, steroids and keloids, primary tendon repairs, history of the bolus dressing, prune belly syndrome, earlobe keloids, pharyngeal flap augmentation, and sweat gland tumors.

Patient Care

October 1, 1973 was a doubly auspicious date in the history of the Surgical Service. The new intensive care unit completed its first year of operation and a new \$5,000,000 emergency facility on VC 1 was opened to the public.

Trauma is an epidemic disease in our society; it is the leading cause of death and morbidity in the first five decades of life. The opening of the new emergency room sets the stage for other possible reorganization over the next year to enable us to deal more effectively with the patient care, training, and research aspects of this problem. Even before the opening of the new emergency room the Vanderbilt Clinic emergency facilities had become among the busiest in New York City, second only to Kings County Hospital in the number of patient visits each day. The trend continues upward.

Related to our new trauma facilities are the capabilities that have developed in the intensive care of the urgently ill patient. The Surgical Intensive Care unit has fulfilled the promise held for it when it opened last year: It has become a superb facility for managing patients critically ill with complex conditions. A particular focus of the unit has been on the respiratory tract. Research activities continue to help in clarifying the problems associated with acute respiratory insufficiency, with the other cardiopulmonary and metabolic problems associated with extensive traumatic or surgical injury.

PRESBYTERIAN HOSPITAL

OPERATIONS	1971		1972		1973	
	Priv.	Ward	Priv.	Ward	Priv.	Ward
Heart-Chest, Including Babies Hospital...	630	253	623	227	708	190
Plastic	388	432	410	392	383	351
Gastrointestinal	386	165	404	225	357	170
Gall Bladder-Pancreas	292	142	288	164	281	186
Appendectomy	52	70	41	109	41	76
Rectal	274	129	229	41	227	21
Breast	432	125	588	142	662	176
Hernia	521	168	416	119	401	143
Other Abdominal	181	120	189	177	174	143
Miscellaneous, Including Vascular	325	109	464	107	421	163
Pediatrics	281	238	403	289	430	280
Head-Neck	197	58	97	25	127	27
Thyroid	242	83	195	31	166	25
TOTALS	4,201	2,092	4,347	2,048	4,378	1,951
	6,293		6,395		6,329	

The surgical follow-up and aftercare clinics, now coordinated into the team system, have improved patient care with availability of attending surgeon consultations and decreased waiting time for expert opinion.

The semiprivate service continues to supply large numbers of patients for resident surgical experience. It also has had a salutary effect in providing private surgical care for more individuals than heretofore at the Medical Center. The problems in the physical plant, small number of lavatories and lack of a conference area, continue as a serious shortcoming.

The organization of Harkness Pavilion to admit most surgical patients to the 4th and 6th floors has resulted in better patient care, as reflected by both nursing and surgical coverage. With the advent of the new team system, private patients have been increasingly used for resident and medical student education. With better resident coverage of private cases, surgical care in Harkness has improved significantly.

Affiliations

In addition to the primary affiliation between Columbia University and Presbyterian Hospital, there are also affiliation agreements between the University and the following hospitals: Delafield, Harlem, Roosevelt, St. Luke's, and Mary Imogene Bassett. Faculty on the Surgical Services of these hospitals are increasing their participation in the teaching and research programs of the Department. An expanding role for these members of the Surgical Faculty is foreseen.

Contributions

We acknowledge with gratitude contributions to surgical research from the following: Mr. Charles Allen, Jr., Mr. Reginald Auchincloss, Mr. and Mrs. Herbert Allen, Mrs. Doris Berk, Mr. and Mrs. Frederic A. Bourke, Jr., Mr. and Mrs. E. B. Bonham, Mr. William M. Bristol, III, Mr. and Mrs. R. H. Casey, Dr. and Mrs. Salvador Castells, S & S Carting Co., Inc., The Comis Family, Nancy A. Carmody, Mr. and Mrs. L. Cowan, Dr. Roberta Fenlon, Mr. Cyrus Fisher, Harry Greenberg Foundation, The Vanneck-Bailey Foundation, John Lindsley Trust Fund, George Kantrowitz Fund, The John A. Hartford Foundation, Inc., The Gollin Founda-

tion, The Houghton Foundation, Charles Edison Fund, Maxwell Leeds Pediatric Tumor Foundation, Joseph and Arlene Taub Foundation, Mrs. Jeanne Goldman, Mrs. Eva M. Goldstein, Mr. and Mrs. Abram R. Gross, Mrs. Frank W. Glaser, Grune & Stratton, Inc., Mrs. Muriel Gruber, H. H. Hoyt, Harcourt Brace, Jovanovich, Inc., Mary W. Harriman Trust, Evelyn A. Jaffee Charitable Trust, Rabbi and Mrs. Allen S. Kaplan, Mr. Sidney Kraines, Mr. and Mrs. C. Koby, Mrs. M. Leader, Mr. and Mrs. Martin Mainzer, Mrs. Gertrude Maged, Mrs. William Marr, Mrs. Donald Mason, Miss E. Mauthner, Mr. Robert Michaels, Mr. and Mrs. Ernst Mendels, Mr. and Mrs. Henry H. Muller, Nice-Pak Products, Inc., Mr. and Mrs. George D. O'Neill, Dr. Marion I. Osterhaut, Dr. and Mrs. Robert S. Ort, P & S Class of "51," Mr. Joseph Pearlman, Bernard E. and Mildred C. Pollak Fund, Mr. and Mrs. Daniel Ripoll, Dr. and Mrs. Arthur T. Ribbrook, Mr. Steven J. Ross, Mr. and Mrs. John H. Shaw, Mr. and Mrs. Robert M. Sayers, Mrs. Miriam H. Schlesinger, Mrs. Bianca Schloss, Dr. H. Schwartz, Mr. Max Schwartz, Mr. Steven Sicherman, Dr. Morris Siegel, Dr. Maxmillian Silverman, Dr. Betty Simons, Mrs. Julia Sperling, Mrs. Margaret Stinchfield, Mrs. Harold Tananbaum, Mrs. Elise Tillman, Mrs. Joan Toepfer, Edith M. Schweckendieck Trusts, The G. Unger Vetlesen Foundation-Ambrose Monell Foundation, Mr. and Mrs. Alfred Vogts, Mr. Henry Westphalen, F. Weiler Charity Fund, Stephen H. Weiss Foundation, Weissman Foundation, Mr. and Mrs. Martin Weinberg, Margaret H. White, Anne Winslow, Mr. Martin Wolf, The Joe and Emily Lowe Foundation, Joseph M. Schoenberg, Mr. and Mrs. Sam A. Sorkin, The Hoyt Foundation, Mr. and Mrs. Louis G. Cowan, William A. Shea, Dick Monning, Lescarden, Estate of Samuel Dixon (Mrs. Schickhaus), Mr. and Mrs. Abba Bayer, Mr. and Mrs. A. D. Klyver; also Mr. & Mrs. F. Bering, Mrs. Florence R. Casey, Consolidated Refining Co., Inc., Mrs. & Mrs. Robert Coplon, Mrs. & Mrs. Arthur Eisen, Mr. J. Robert Fisher, Mr. George C. Haley, Mr. & Mrs. Sydney Hinerfeld, Miss Elizabeth A. Hull, Mr. & Mrs. Lawrence Kurzon, Miss Betty Little, Michaels Philanthropic Foundation, Miss Daisy H. Pandaleon, Mrs. Marion Seal, Mrs. Alice B. Warfield, Mrs. Regina Weissman—The Weissman Charitable & Educational Fund, Inc., Mr. & Mrs. Louis J. Werner.

1973 Publications

Surgery

- Badder, E.; Gump, F. E. and Kinney, J. M.
Circulatory requirements for heat transport. *Surg. Forum* 24:90, 1973.
- Badder, E.; Magill, T. and Gump, F. E.
Regional alpha-adrenergic blockade and the pulmonary response to hypoxia. *Surgery* 74:555, 1973.
- Bregman, D.; Bolooki, H. and Malm, J. R.
A simple method to facilitate difficult intraaortic balloon insertions. *Ann. Thorac. Surg.* 15:636, 1973.
- Crikelair, G. F.
Solution to the burn problem: Prevention. In: *Symposium on the Treatment of Burns*. Vol. 5. J. B. Lynch and S. R. Lewis, ed. C. V. Mosby Co., St. Louis, 1973.
- Drusso, R. G.; Symonds, F. C. and Crikelair, G. F.
The problem of somatic delusions in patients seeking cosmetic surgery. In: *Yearbook of Plastic & Reconstructive Surgery*. Year Book Publishers, Chicago, 1973, pp. 331-332.
- Edie, R. N.; Gersony, W. M.; Krongrad, E.; Bowman, F. O. and Malm, J. R.
Surgical repair of single ventricle. *J. Thorac. & Cardiovasc. Surg.* 66:350, 1973.
- Ellis, K.; Jaffe, C.; Malm, J. R. and Bowman, F. O.
Infective endocarditis. Roentgenographic consideration. *Radiol. Clin. North America* 11:415, 1973.
- Fenoglio, C.; Kaya, G. and Lane, N.
Distribution of human colonic lymphatic in normal, hyperplastic and adenomatous tissue. *Gastroenterology* 64:51-66, 1973.
- Futch, C.; Zikria, B. A. and Neu, H. C.
Bacteroids liver abscess. *Surgery* 73:59-65, 1973.
Bacteroids liver abscess (Abstract). *Surg. Digest* 7:32, 1973.
- Galloway, S.; Casarella, and Price, J. B., Jr.
Unilobar veno-occlusive disease of liver; angiographic demonstration intrahepatic competition simulating hepatoma. *Am. J. Roentgenol.* 119:89, 1973.
- Gersony, W. M.; Bathany, S.; Bowman, F. O. and Malm, J. R.
Late follow-up of patients evaluated hemodynamically after total correction of tetralogy of fallot. *J. Thorac. & Cardiovasc. Surg.* 66:209, 1973.
- Gongaware, R. D.; Weil, R., III and Santulli, T. V.
Right-lower lobe pneumonia and acute appendicitis in childhood: A therapeutic dilemma. *J. Pediatr. Surg.* 8:33, 1973.
- Gump, F. E.; Long, C.; Wong, M. and Kinney, J. M.
Exogenous glucose as an energy substrate in experimental hemorrhagic shock. *Surg., Gynec. Obst.* 136:611, 1973.
- Gump, F. E.; Martin, P. and Kinney, J. M.
Energy metabolism in surgical patients: Oxygen consumption and caloric expenditure. *Surg., Gynec., Obst.* 137:499, 1973.
- Gusberg, R. J.; Scholz, P. M.; Gump, F. E. and Kinney, J. M.
Can protein breakdown explain the increased caloric expenditure in injury and sepsis? *Surg. Forum* 24:79, 1973.
- Haagensen, C. D.
A great leap backward in the treatment of carcinoma of the breast. (Editorial). *J.A.M.A.* 224:1181, 1973.
- Ju, D. M. C.
On the etiology of cancer of the lower lip. *Plast. & Reconstr. Surg.* 52:151-154, 1973.
- Kaye, G. I.; Fenoglio, C.; Pascal, R. R. and Lane, N.
Comparative electron microscopic features of normal hyperplastic and adenomatous human colonic epithelium. *Gastroenterology* 64:926-945, 1973.
- King, T. C.
An answer in search of a question (Editorial). *New England J. Med.* 289:687-688, 1973.
- Kinney, J. M.; Gump, F. E. and Long, C. L.
Energy and tissue fuel in human injury and sepsis. In: *Neurohumoral and Metabolic Aspects of Injury*. Kovach, Stoner, and Spitzer, ed. Plenum Publishing Co., New York, 1973, pp. 401-407.
- LiVolsi, V. A.; Feind, C. R.; LoGerfo, P. and Tashjian, A. H., Jr.
Demonstration by immunoperoxidase staining of hyperplasia of parafollicular cells in the thyroid gland in hyperthyroidism. *J. Clin. Endocrinol.* 37:550-560, 1973.
- LiVolsi, V. A. and Jaretzski, A.
Granulomatous esophagitis. *Gastroenterology* 64:313-319, 1973.
- LiVolsi, V. A.; Perzin, K. H.; Badder, E. M.; Price, J. B. and Porter, M.
Granular cell tumors of the biliary tract. *Arch. Path.* 95:13-17, 1973.
- LiVolsi, V. A.; Perzin, K. H. and Porter, M.
Polyarteritis nodosa of the gall bladder presenting as acute cholecystitis. *Gastroenterology* 65:115-23, 1973.
- LoGerfo, P.
Immunology and colon cancer. *Dis. Colon Rectum* 16:366-367, 1973.
- LoGerfo, P.; Herter, F. P. and Bennett, S.
Studies on tumor associated antigen. *J. Surg. Res.* 15:290-295, 1973.
- LoGerfo, P. and Hsu, C.C.S.
Effects of halothane and cyclopropane anesthesia on the PHA response of lymphocytes. *J. Surg. Oncol.* 5:229, 1973.
- Long, C. L.; Zikria, B. A.; Geiger, J. W. and Kinney, J. M.
Comparison of fibrin hydrolysates and crystalline amino acid solutions in parenteral nutrition. *Fed. Proc.* 32:915, 1973.
- Ludwig, A.; Okagaki, T.; Richart, R. and Lattes, R.
Nuclear DNA contact of lobular Ca-in-situ of the breast. *Cancer* 131:1553-1560, 1973.

- MacMillan, R. W.; Schullinger, J. N. and Santulli, T. V.
Pyourchus: An unusual surgical problem. *J. Pediat. Surg.* 8:387, 1973.
- Malm, J. R.
Cardiothoracic surgery. (What's new in surgery?)
Surg. Gynec. Obst. 136:191, 1973.
Thoracic training programs as evaluated by the residency review committee. *J. Thorac. Cardiovasc. Surg.* 66:158, 1973.
- Max, M. H.; Wolff, M.; Broell, J. R. and Gump, F. E.
The effect of long term steroid therapy on the histopathology of regional enteritis. *J. Surg. Res.* 14:124-132, 1973.
- Marker, C.; Parodi, E.; Bowman, F. O.; Malm, J. R. and Reemtsma, K.
Saphenous vein coronary artery pressure flow measurement. *New York J. Med.* 73:649, 1973.
- Price, J. B., Jr.; Whittemore, A.; Kasuya, M.;
Fodor, P. and Voorhees, A. B., Jr.
Glucagon as a modifier of hepatic regeneration in the rat. *Gastroenterology* 65:565, 1973.
- Reemtsma, Keith
Primates as organ donors in transplantation studies in man. In: *Nonhuman Primates and Medical Research*. Chapter 7. Geoffrey H. Boune, ed. Academic Press, New York, 1973, pp. 203-212.
- Stanley, T. H. and Zikria, B. A.
The effect of fat-soluble anesthetic agents on tracheal-bronchial secretion surface tensions. *Surgery* 73:386-389, 1973.
- Stein, J. A. and Price, J. B., Jr.
Asymptomatic bilious ascites after percutaneous trans-hepatic cholangiogram. A case report. *Gastroenterology* 64:1013, 1973.
- Suciu-Foca, N.; Buda, J. A.; McManus, J.; Theim, T. and Reemtsma, K.
Impaired responsiveness of lymphocytes and serum inhibitory factors in patients with cancer. *Cancer Res.* 33:2373-2377, October 1973.
- Suciu-Foca, N.; Buda, J.; Reemtsma, K.; LoGerfo, P.; Moulton, A.; Weber B. and Wheler, B.
Serum blocking factors in cancer. *Clin. Res.* 23:590, 1973.
- Warden, G. D.; Reemtsma, K. and Steinmuller, D.
The phenomenon of adaptation: Graft or host? *Transplant. Proc.* 5:635, 1973.
- Whittemore, A.; Kasuya, M.; Fodor, P.;
Price, J. B., Jr. and Voorhees, A. B., Jr.
Hepatic regeneration in the rat without portal organs. *Surg. Forum* 24:384, 1973.
- Zikria, B. A.
Smoke poisoning in fires. *ACS Polymer Reprints* 14:1017-1021, 1973.
CO level measures smoke injury. *Med. World News* 14:34, Sept. 1973.

Urology

JOHN K. LATTIMER

Professor and Chairman of the Department • Director of Service

In 1973 numerous members of the staff of the Squier Urologic Clinic were honored. The resident staff distinguished themselves by winning four major prizes for original laboratory research in the Annual Essay Contest at the New York Academy of Medicine sponsored by the New York Section of the American Urological Association. The first prize in laboratory research was won by Dr. John Byrne for his studies of "Mechanical Factors Affecting Urethral Flow Rate." Second prize was awarded to Dr. James Mooney for his work on "The Intrinsic Defense Mechanism of the Urinary Bladder Surface." Dr. James Umhey won honorable mention for his paper on "Sympathetic Innervation of the Human Ureter," as did Dr. Michael Wechsler for "Studies of Isolated Kidney Preservation Using a Beta-Lipoprotein-Free Perfusate."

Dr. Maguid Megalli received the Valentine Award from the New York Academy of Medicine—he completed 17 research projects during his residency—and will use this award to study for the D. Med. Sc. degree in Pathology in the College of Physicians & Surgeons.

Dr. Meyer M. Melicow received the Wirt B. Dakin Prize for an exhibit on "The Castrati Singers" at the 68th Annual Meeting of the American Urological Association in New York City, and Dr. John K. Lattimer was presented with the Hugh Young Award of the American Urological Association in recognition of outstanding contributions to American urology. Dr. Lattimer was also elected President of the Société Internationale D'Urologie, the Paris-based organization for world urology, at its meeting in July in Amsterdam. He was also appointed to the

Editorial Board of *Geriatrics* and was elected President of the Section on Urology of the American Academy of Medicine.

Dr. Myron Roberts was elected Chairman of the Section on Urology of the New York Academy of Medicine.

Dr. Hans Zinsser was elected to the Board of Directors of the American Medical Writer's Association and continues as corresponding secretary of the New York Academy of Medicine.

Dr. Ralph J. Veenema was elected Chairman of the Advisory Council for Urology of the American College of Surgeons and continued on the Executive Committee of the American Urological Association's New York Section. He was an invited speaker at the National Conference on Urological Cancer in Washington in March. He also served on the Executive Committee of the Faculty Council and the Medical Board of Francis Delafield Hospital and was an Associate Editor of *Urology* and a participant in the National Bladder Cancer project.

Appointments

Dr. Michael Wechsler, who had his residency at the Squier Urologic Clinic and has been an N.I.H. research fellow both at Bethesda and New York, was appointed Assistant Professor of Urology after completing a fellowship in Pediatric Urology at the Hospital for Sick Children in Great Ormond St., London.

Curriculum

The urological curriculum was revised and expanded, particularly in the sphere of elective work,

which has proved of interest to students both from P&S and other medical schools. The continuing and increasing involvement of these exchange students in our teaching program has been most gratifying.

Videotape cassette players were incorporated into the Department's educational armamentarium, along with the television cameras and instant playback capability which have added so much to the teaching by this Department, in which Dr. Lattimer creates a simulated patient-doctor situation with the students.

Training Grants

The discontinuance of all research training grants by the federal government resulted in the loss of the extra year of special research training which formerly attracted a large proportion of the graduates of this Department's training program into academic activities, where good men are sorely needed. The Columbia program was the oldest and largest of all the urology research training programs.

In January, Dr. Meyer M. Melicow again gave his annual course in Postgraduate Urology. Enrollment of graduate urologists and pathologists from the metropolitan area continued to grow, as the need to pass the stiff examination by the American Board of Urology grows more essential for all who wish to practice urology.

Departmental Activities

Members of the staff were invited lecturers at numerous meetings during 1973. Dr. Lattimer presented the Stoneburner Lecture Series at the Medical College of Virginia and the Mid-Atlantic Section of the American Urological Association College of Virginia in February, on "Carcinoma of the Prostate: The Great Widow Maker," and "The Optimum Treatment for Undescended Testes." In March, he gave the Richard Chute Lecture on "Aspects of Genitourinary TB" and "Carcinoma of the Prostate" at the Boston University School of Medicine, the Tufts University School of Medicine, and the Combined Staff Seminar of the Department of Medicine on "A Reconstructive Approach to Transsexualism."

Dr. Melicow delivered a series of lectures at the South African 9th Biennial Urology Congress in the Kruger National Park, South Africa in August 1973. The subjects included "The Evolution of Urology," "Tumors of the Adrenals," and "Tumors of Testis."

Dr. Melicow also lectured at the Pathobiological Institute, Aspen, Colorado on August 9, 1973, and at the Veterans Administration Hospital, East Orange, N. J., on October 19, 1973 on "Unusual Pathological Lesions Involving the GU Tract."

Dr. Ralph J. Veenema lectured: (1) at the National Conference on Urologic Cancer, Washington, D. C., March 29-31, 1973, on "Chemotherapy in the Management of Bladder Tumors," (2) at the National American Urological Association Meeting, New York City, May 14-17, 1973, on "Apparent Inhibition of Bladder Carcinogenesis in the Rat by Allopurinol," (3) at the International Society of Urology meeting, XVIth Congress in Amsterdam, July 2-6, 1973, on "Surgical Treatment of Carcinoma of the Prostate," "Bone Marrow Acid Phosphatase in Staging of Prostate Cancer," "Observations on Peripheral Blood RNA in Prostate Cancer," and "Effects of Cryotherapy of Prostate on Serum Immunoglobulins."

On September 17, 1973 Dr. Melicow lectured on "Pathology of Testicular Tumors" at the Albert Einstein College of Medicine.

Dr. Peter DeSanctis lectured on "Urological Management of Meningomyelocele," at the Spina-Bifida Seminar, Glens Falls, New York, February 1973.

Dr. J. Timothy Donovan served as a Visiting Professor in the Department of Urology at the University of Tübingen, West Germany, during July and August 1973.

The American Urological Association held its national meeting in New York in May 1973. Many members of the Department served on the committees which organized and administered the details of this meeting. Presentations by Department members at these meetings included papers on a variety of clinical and research studies. Dr. DeSanctis presented a paper on "Intermittent Catheterization—Rationale for its Use in Non-Spinal Injured Patients." Dr. Nichols J. Romas presented "Apparent Inhibition of Bladder Carcinogenesis in the Rat by Allopurinol." Dr. Peter J. Puchner presented "Absorption of P³² Thio-Tepa in Normal Rat Bladders." Dr. Mooney presented "Differences in Cell Surface of the Proximal and Distal Female Canine Urethra." Members of the Department served as discussants and chairmen of several panels on current urological problems during the meetings.

At the Meeting of the American Academy of Pediatrics in October 1973 in Chicago, Drs. Puchner and Lattimer presented a paper on "Posterior Urethral Valves."

At the meeting of the New York Section of the American Urological Association, in November 1973 in Puerto Rico, Dr. DeSanctis presented a paper on "Urologic Perspective in the Management of Children With Meningomyelocele"; Dr. Lattimer spoke about "New York: The Great Urological Training

Ground"; Dr. Rudin delivered a paper on "The Incidence of Extrathoracic Sarcoid"; Dr. Wiederhorn reported on "Evaluation of Wallace Ureteral-ileal Anastomoses"; Dr. Guarin of Harlem Hospital read a paper on "Splendo-Gonadal Fusion"; and Dr. Megalli presented a paper on the "Relief of Ureteral Obstruction Due to Prostatic Cancer by Radiotherapy."

Drs. Erol Gursel and Veenema presented "Bone Marrow Acid Phosphatase in the Staging of Prostatic Carcinoma" and "Effects of Cryotherapy on Circulating Immunoglobulins in Patients With Prostatic Cancer" at the International Congress of Urology in Amsterdam in July 1973.

Drs. Megalli and Gursel presented the following papers at the II International Symposium on Cryosurgery and Endoscopy in Urology in Stuttgart, West Germany, July 1973: (1) "Closed Transperineal Cryosurgery for Prostate Cancer; a New Probe and Technique," (2) "Complication of Cryosurgery of the Prostate," and (3) "Immunoglobulin Levels After Cryosurgery of the Prostate."

Drs. Stanley B. Braham, Myron Roberts, and Frank Longo evaluated use of management systems and the computer in urologic practice in Southern Florida and use of these systems for delivery of patient care in the New York area. These studies were made with the assistance of professional automated systems of Florida and G.H.I. of New York.

Dr. Mooney investigated the ultrastructure of the mammalian bladder urothelium in normal and diseased states. Similar studies were made on the female urethra and the effects of hormones and infection on its urothelium.

Dr. John Birkhoff with Dr. Andrew Frantz (Medicine) studied prolactin in aging males. The possible relationship between this hormone and the development of benign and cancerous growth was investigated. Further evaluation of the possibility of inducing remission in advanced prostatic cancer by alteration of prolactin levels is proceeding.

The Urology Research Laboratories under the direction of Dr. Myron Tannenbaum continued morphologic and immunopathologic studies of genitourinary neoplasms. Experiments are in progress in the isolation and purification of specific antigens associated with prostatic, renal, and other genitourinary tumors. Experiments were performed with frozen sections of tumor using fluorescein-labeled antibodies to carcinoembryonic antigen, tumor-associated antigen, human immunoglobulins, and complement. Techniques adapted by Dr. Konrad Hsu (Microbiology) can now be used on frozen and paraffin-embedded specimens. This represents a valuable step

in the search for immunologic factors on viruses in human cancers.

Dr. Phillip Tomashefsky, Assistant Professor of Pathology (Urology), investigated the immunogenic potential of the Furth-Columbia rat Wilms tumor.

Dr. Aurelio Uson and Mr. Gregory Fisher of the fourth year class started work in the development of an artificial urinary bladder. Mr. Fisher is devoting his elective year to testing biocompatible materials in order to determine their suitability for total bladder prostheses with a "sphincter-like" mechanism. A prototype of a prosthetic sphincter was constructed by Mr. Fisher and early implantation into a laboratory animal is contemplated.

Continuing studies in oncological urology were pursued at the Francis Delafield Hospital under the direction of Dr. Veenema.

Dr. Braham continued work with the members of the Department of Medicine on the surgical management of hypertension arising from abnormalities of the adrenal glands.

Dr. Harry Seneca continued studies of new drugs used for treatments of urinary infection, and was called by the government of Brazil, where a Chagas Disease Foundation was organized. The purpose of this organization is to immunize the people in endemic zones where Chagas disease is prevalent using the Chagastoxin that was developed at Columbia University. Also, the possible application of Chagastoxin in the treatment of cancer in Brazil is being considered.

Dr. Romas continued studies of tryptophane inhibitors and their effect on bladder carcinogenesis.

Dr. Hans Zinsser helped in the organization of a new journal, *Urology*, on whose editorial staff Dr. Veenema also serves.

The 15-year results of the renal stone clinic are being evaluated by Dr. Zinsser with Dr. Longo and work with a new calcium stone preventive agent is proceeding with Dr. Robert Canfield in a joint effort with the Department of Medicine.

The prostatic hypertrophy medical treatment trials continue. The series with Candicidin was completed. A base line for the rate of deterioration in control cases was established. A new antiandrogen and an antiprolactin agent are under trial now and two more are under consideration.

Dr. Zinsser's work on the structure of elastin with Dr. Mandl and Dr. Dempsey continues.

In short, the Department of Urology, which is one of the largest and the most active in the scientific world, continued its pace in research and development of better treatments, but has been hampered

by the government research funding cutback. The educational and historical divisions of the Department worked effectively throughout the year.

Donors

The Department extends its sincere appreciation to the many whose vital support helped to make possible its activities: Mr. and Mrs. Malcolm P. Aldrich, Jack Alpern, Elmore L. Andrews, Alex Ardrey, Mr. and Mrs. Marcel Armand, Irving R. Arret, Dr. Reginald Auchincloss, Mrs. Rose Avelino, Ayerst Laboratories, friends of the late Harriet L. Bergmann, Mr. Louis Berkowitz, Mr. and Mrs. Edward D. Bickford, Allen H. Bixen, Mrs. James Bleecker, Dr. Stanley B. Braham, Mrs. Evelyn Brogren, The Brook Foundation, Inc. (The Late Gov. Charles Edison), Burroughs Wellcome & Co., Inc., Mr. V. Byrne, Mr. and Mrs. William H. Byrne, The George F. Cahill Fund, Mrs. Reed M. Chambers, Morris Chernofsky, Mrs. Joseph Chernow, Michael Chernow (The Chernow Fund, Inc.), Walter Collins, The Commonwealth Fund, Mr. and Mrs. James N. Cost, Edouard L. Cournand, Marc Cramer, Mr. and Mrs. Alfred D'Arco; Paul H. Davis, Mrs. John E. Dempsey, Samuel D. Denburg, Dr. Peter N. DeSanctis, Dr. William B. Deyo, Louis Diamond, Bertha Dillon—Susan Douglass Foundation, Inc., Clarence Dillon, Dr. J. Timothy Donovan, Dr. Louis J. Dougherty, Mrs. Louis W. Douglas (Panano Foundation), Alfred H. Drewes Memorial Fund, Eaton Laboratories, Mr. M. J. Edelson, Charles Edison Fund, J. R. Elyachar, Endo Laboratories, Mrs. Elda Esposito, Mr. and Mrs. Gerald Ettenberg, Dr. Abraham H. Fineman, Mr. and Mrs. Max Freedman, Frigitrionics of Conn., Inc., Ernest H. Froebel, Dr. Gustav Friedman, Mr. and Mrs. Ferdinand Galic, Mr. Norman Gatof, Mr. and Mrs. Paul Gatof, General Mills Foundation, Irene Heinz and John LaPorte Given Foundation, Inc., Murray Glaser, Harry Goldman, Mr. William Goldsmith, Mr. Donald J. Goldstein, Mr. and Mrs. Oscar Goldstein, Mr. and Mrs. Joseph G. Golub, Mr. and Mrs. Nicholas P. Goulandris, Dr. John P. Grant, Jr., The Harry Greenburg Foundation, Inc., Dr. Leslie K. Gulton, George H. Haley, Joseph Heiferman, Mrs. Jessie E. Hensel, Albert M. Herrmann, Mrs. Jerome Hess, Norbert Hess, Mrs. Ben R. Johnson, Mr. and Mrs. Eddie Jonas, Kahn—Markowitz Foundation, Chester Keating, Hannah Klein, Louis H. Klonsky & Co., Henry Kohn (The Ed Lee and Jean Campe Foundation), Mr. P. Kolk, Mr. and Mrs. Herbert Korn, Mr. and Mrs. Donald Kramer, Mr. and Mrs. Martin Krasner, Mr. Albert Krassner, Dr. John K.

Lattimer, Lederle Laboratories, Helen Lemberg, C. Liff, Manice DeForrest Lockwood, Dr. Frank W. Longo, Mr. and Mrs. Mitchell Manning, Mr. and Mrs. Richard Manning, Mrs. Jean Markowitz, Cecile Lehman Mayer Medical Foundation, Clarence F. McCarthy, Mrs. Thomas McGrath, Aaron and Rachel Meyer Memorial Foundation, Inc., Mr. and Mrs. LeRoy Miozzi, Leo Model, Frank N. Morgenstern, Morris and Celia Morgenstern Medical Research Endowment Foundation, Reverend and Mrs. Ewald H. Mueller, Charles S. Munson, National Institutes of Health, National Institute of Arthritis and Metabolic Diseases; Mr. and Mrs. Samuel I. Newhouse, Charles J. Oppenheim, Jr., C. Michael Paul (Charles Ulrich and Josephine Bay Foundation, Inc.), Charles J. Pallesen, Jr., Fred and Gertrude Perlburg Foundation, Inc., The Joseph and Grace Perlman Foundation, Mr. Louis Perlman, Pfizer, Inc., Florence C. Phelps, Spelman Prentice, Mrs. Edith Printz, Dr. Peter J. Puchner, Henry S. Reeder, Otto B. Reimer, J. Squier Reimer, Benjamin W. Rice, Dr. Myron S. Roberts, Dr. John M. Robinson Memorial Fund, Mrs. John M. Robinson (The Widgeon Foundation), Dr. Nicholas A. Romas, Mr. Marc S. Rothenberg, Murry M. Rothenberg, Randy Rothman, Michael Scharf (Unimet Corp.), Schering Corporation, Julius Schmid, Inc., Mr. and Mrs. John Schreiber, Arnold Schwartz (Brookdale Foundation), F. A. O. Schwartz, Dr. John Scudder, Mr. and Mrs. Larry Segal, Mr. Herman Segel, Dr. Harry Seneca, The Shubert Foundation, Walter H. Simpson, Dr. Arthur M. Smith, E. R. Squibb & Co., Mrs. Ina Steinberg, Mr. Leonard M. Stone, Mr. and Mrs. Edward Streim, Mr. Alfred A. Strelsin, Milton E. Sullivan, Alexander Summer (Alexander Summer Family Foundation), Mr. Joel S. Sussman, Dr. Moses Swick, Mr. and Mrs. Meyer Tartasky, Charles G. Taylor, Dr. and Mrs. Leopold Tecuanhuey, Tenneco, Inc., Susan Bickford Thomas Memorial Gift for Medical Research (Friends and Relatives of the late Susan Bickford Thomas), Mr. and Mrs. Fred Thomases, Mr. and Mrs. Burton G. Tremaine, Mr. Dale Tuller, U. S. Aviation Underwriters, Inc. (staff), Dr. Aurelio C. Uson, Mrs. Rankine P. Van Anda, Dr. Ralph L. Veenema, Mr. and Mrs. Abraham Vernikov, Oscar A. Villafane, Mr. and Mrs. Edwin G. Vogel Fund, Inc., Lowell Wadmond, DeWitt Wallace Research Gift, Mrs. Charlotte Wank, Mr. Stewart Warner, Warner-Lambert Co., Mr. and Mrs. Samuel Webster, Zelda Radow Weintraub Cancer Fund, Inc., William E. Wiegand, Mrs. Tess Weissblum, and Harold Zuckerman (Zuckerman Contractors, Inc.).

1973 Publications

Urology

- Birkhoff, J. D. and McClennan, B. L.
Echinococcal disease of the pelvis. *J. Urol.*, 1973.
- Bredin, H. C.; Lavengood, R. W. and Barondess, J. A.
Renal hamartoma: Arteriographic findings suggesting hypernephroma. *Urology* 2, No. 5, 1973.
- Byrne, J.; Bottaccini, M. R. and Gleason, D. M.
Energy loss during micturition. *Invest. Urol.* 10:221, 1972.
- Fernandes, M.; Draper, J. W. and Shah, K.
Vasovasostomy: Improved microsurgical technique (Abstract). In: *Vasectomy: Current Research in Male Sterilization*. MSS Information Corporation, New York, 1973.
- Fernandes, M.; Lavengood, R. W. and Ward, J. N.
Reconstruction of lower ureter and urethra, and closure of vesicovaginal fistula and other bladder defects. *Urology* 1:444-452, 1973.
- Gursel, E., et al.
Penile carcinoma; Clinico-pathological evaluation of 64 cases. *Urology* 1:569, 1973.
- Gursel, E.; Roberts, M. and Veenema, R. J.
Cryotherapy in advanced prostate cancer. *Urology* 1:392, 1973.
- Gursel, E. and Veenema, R. J.
Bone marrow acid phosphatase in staging of prostate cancer. *Proc. Internat. Soc. of Urol.*, vol. II, 1973.
Effects of cryotherapy on circulating immunoglobulins in patients with prostate cancer. *Proc. Internat. Soc. of Urol.*, vol. II, 1973.
- Hanafy, H.; Gursel, E. and Veenema, R. J.
Serum amylase in patients with benign and malignant diseases of the prostate gland. *Urology* 1:372, 1973.
- Horan, A. H.
The pathogenesis of hydro-testes after ligation of the vas deferens: A study in several species. *J. Urol.* 110:317, 1973.
- Horan, A. H. and Mooney, J. K.
Epididymal obstruction: The frequency in elderly men. *J. Urol.* 110:227, 1973.
- Hsu, K. C.; Zimmerman, E. A.; Rudin, L.;
LoGerfo, P.; Bennett, S. and Tannenbaum, M.
Application of immunoperoxidase bridge technique in studies of tumor tissues with antibody to tumor-associated-antigen (TAA). *Proc. 2nd Conf. and Workshop on Embryonic & Fetal Antigens in Cancer*. Oak Ridge, Tenn., 1972, p. 147.
- Lattimer, J. K.
Migratory testes. *Clin. Trends Urol.* 1:6, 1972.
Carcinoma of the prostate: The great widow-maker. *Med. College Virginia Quart.* 9:240, 1973.
The optimum treatment for undescended testis. *Med. College Virginia Quart.* 9:270, 1973.
- Lattimer, J. K.; Lattimer, J. and Lattimer, G.
Further information about the autopsy of President John F. Kennedy. *Forensic Sc. Gaz.* 4, No. 4, 1973.
- Lattimer, J. K. and Smith, A. M.
Scrotal pouch technique for orchiopexy. In: *Urologic Procedures*, vol. 2. Warner Chilcott Co., Morris Plains, N. J. 1973, pp. 1-15.
- Lattimer, J. K.; Vakili, B. and Smith, A. M.
The dorsal tilt: An embellishment to any operation for hypospadias. *J. Urol.* 109:1035, 1973.
- Lattimer, J. K.; Vakili, B.; Smith, A. M. and Morishima, A.
A natural feeling testicular prosthesis. *J. Urol.* 110:81, 1973.
- Megalli, M.
Poor results of bladder closure cited (exstrophy). *Pediat. Herald* 13, Nov., 1972.
- Megalli, M. and Lattimer, J. K.
Review of the management of 140 cases of bladder exstrophy. *J. Urol.* 109:246, 1972.
- Megalli, M.; Gursel, E. O. and Lattimer, J. K.
Reflux of urine into ejaculatory ducts as a cause of epididymitis in children. *J. Urol.* 108:978, 1972.
- Megalli, M.; Gursel, E. and Veenema, R. J.
A simplified needle for bone biopsy in prostate cancer. *Urology* 1:154, 1973.
Ascitis as an unusual presentation of prostate cancer. *J. Urol.* 110, Aug., 1973.
- Megalli, M.; Gursel, E.; Rudin, L. and Veenema, R. J.
The value of bone marrow calcium in staging of prostate and bladder cancer. *Urology* 2, July, 1973.
- Melicow, M. M.
Doctors' avocations. *P&S Quart.* 17:19, 1972.
Physicians' art club. *New York J. Med.* June, 1973, p. 1339.
The duality of physicians. *P&S Quart.*, Summer, 1972.
Hippocrates bust and article. *P&S Quart.*, Spring, 1972.
Fildes and Picasso. *P&S Quart.*, Fall, 1972.
Nature's living skyscrapers. *P&S Quart.*, Winter, 1973.
Springtime, Riverside Drive. *P&S Quart.*, Spring, 1973.
- Melicow, M. M.; Gursel, E. O. and Megalli, M.
Occult malignant melanoma metastasizing to prostate and testis. The patient also had a primary adenocarcinoma of the prostate. *Urologists' Letter Club*, May 4, 1973.
- Melicow, M. M.; Lattes, R. and Pierre-Louis, C.
Lymphoma of the female urethra masquerading as a caruncle. *J. Urol.* 108:748, 1972.
- Melicow, M. M.; Uson, A. and Veenema, R. J.
Malignant non-functioning pheochromocytoma of the organ of Zuckerkandl masquerading as a primary carcinoma of prostate with metastases. *J. Urol.* 110:97, 1973.
- Mooney, J. K.; Cox, C. E. and Hinman, F.
Vesical contamination from insertion of everting COT or catheter in inoculated canine urethra. *Invest. Urol.* 11:248, 1973.

- Prasad, S.; Smith, A. M.; Uson, A.; Melicow, M. and Lattimer, J. K.
Foreign bodies in urinary bladder. *Urology* 2:258, 1973.
- Puchner, P. J.
Bacteriuria in a young woman. *Roche Image* 14, No. 8, 1972.
- Renert, W. A.; Rudin, L. J. and Casarella, W. J.
Renal vein thrombosis in carcinoma of the renal pelvis. *Am. J. Roentgenol.* 114, No. 4, April, 1972.
- Rezvani, A.; Ward, J. N. and Lavengood, R. W.
Intra-renal aneurysm following partial nephrectomy. *Urology* 2:286-288, 1973.
- Smith, A. M. and Lattimer, J. K.
Genitourinary tract involvement in children with tuberculosis. *New York J. Med.* 73:2325, 1973.
- Smith, A. M.; Lattimer, J. K. and Rezvan, M.
Current therapy for undescended testicle. *New York J. Med.* 73:2557, 1973.
- Smith, A. M.; Priestley, J.; Tomashefsky, P.; Tannenbaum, M. and Lattimer, J. K.
Current therapy of Wilms' tumor: Investigational background. *New York J. Med.* 73:1652, 1973.
- Smith, A. M.; Reilly, M. and Lattimer, J. K.
Endoscopic examination of lower urinary tract in children—basic instrumentation requirements. *Urology* 2:347, 1973.
- Tannenbaum, M.
Ultrastructural pathology of the adrenal cortex. In: *Pathology Annual*. Sommer, S. C., ed. Appleton-Century Crofts, New York, 1973, p. 109.
- Tannenbaum, M. and Bemby, J.
Tissue culture growth patterns of benign and malignant prostatic glands (Abstract). *Fed. Proc.* 857:3610, 1973.
- Talarico, R. D.
Non-penetrating testicular rupture. *Urology* 1, No. 4, April, 1973.
- Tomashefsky, P.; Lattimer, J. K.; Priestley, J., Jr.; Furth, J.; Vakili, B. F. and Tannenbaum, M.
An experimental Wilms' tumor suitable for therapeutic and biological studies. II. The inhibition of renal compensatory hypertrophy by a transplantable tumor. *Invest. Urol.* 11:141, 1973.
- Vakili, B. F.
Agenesis of the bladder. A case report. *J. Urol.*, March, 1973.
- Veenema, R. J.; Guttman, R.; Uson, A. C.; Senysyn, J. and Romas, N. A.
Improved clinical definition of bladder carcinoma by pre-operative radiotherapy. *Trans. Am. A. GU Surgeons* 64:69-73, 1972. (*J. Urol.* 109:397-401, 1973).
- Wechsler, M.; LoGerfo, P.; Feminella, J. G., Jr. and Lattimer, J. K.
The cancer associated antigen test as an index to failure of complete removal of urological cancers. *Surg. Advances* 3, Oct.-Nov., 1972. (*J. Urol.*, 109, April, 1973).
- Wiederhorn, A. R. and Pickens, R. L.
Serum acid phosphatase levels following prostatic massage: A reevaluation. *J. Urol.*, 109, May, 1973.
- Zimmerman, E. A.; Hsu, K. C.; Robinson, A. G.; Carmel, P. W.; Frantz, A. G. and Tannenbaum, M.
Studies of neurophysin secreting neurons with immunoperoxidase techniques employing antibody to bovine neurophysin I. Light microscopic findings in monkey and bovine tissues. *Endocrinology* 92:931, 1973.
- Zimmerman, E. A.; Hsu, K. C.; Cote, L.; Tannenbaum, M.; Freedman, L. S.; Roffman, M. and Goldstein, M.
Studies of dopamine-B-hydroxylase in bovine pituitary and adrenal glands by immunoperoxidase technique (Abstract). *Fed. Proc.*, April, 1973.
- Zinsser, H. H.
The aging prostate. *Med. World News*, p. 19-20. 1972.
- Zinsser, H. H. and Karp, F.
How to diminish endogenous oxalate excretion I. Tyrosine administration. *Invest. Urol.* 10:249-252, 1973.
- Zinsser, H. H.; Light, I. and Gursel, E. O.
Urinary ionized calcium in urolithiasis. *Urology*, 1:67-70, 1973.
- Computers in urology. *Urology* 1:157-160, 1973.
- The emperor's clothes? *Urology* 2, 1973.

International Institute for the Study of Human Reproduction

RAYMOND L. VANDE WIELE, *Director*

During the last year an administrative reorganization of the International Institute has led to the creation of three major Divisions. The Division of Reproductive Biochemistry and Physiology is under the direction of Dr. Seymour Lieberman, Professor of Biochemistry (in Obstetrics and Gynecology); the Biomedical Division is under Dr. Ralph Richart, Professor of Pathology (in Obstetrics and Gynecology); and the Division of Social and Administrative Sciences is headed by Dr. Samuel Wishik, Professor of Public Health (Public Health practice).

In 1973 the International Institute was designated a National Center for Research in Reproduction by the National Institutes of Health and received a substantial grant for core support of its divisions. Dr. Elizabeth Connell, Associate Professor of Obstetrics and Gynecology, resigned as head of Family Life Services to take a position with the Rockefeller Foundation.

Division of Reproductive Biochemistry and Physiology

The laboratories under the direction of Dr. Seymour Lieberman continued their studies of the biochemistry and metabolism of the steroid hormones. Major topics of interest were: the elucidation of the nature of the intermediary products in the synthesis of pregnenolone and of other steroid hormones secreted by the adrenal, the testes, and the ovaries; mechanisms regulating the secretion of hydroisoan-

drosterone sulfate by the adrenal; the development of methods for tritium labelling of polypeptides and protein hormones; and finally, an investigation of the minor nucleosides in uterine tissue. These studies were reported in more detail in the report of the Department of Obstetrics and Gynecology.

The laboratory studies under the direction of Dr. Georgiana Jagiello, Professor of Human Genetics and Development (in Obstetrics and Gynecology) were also presented in the report of the Department of Obstetrics and Gynecology. The main interest of these laboratories continues to be the cytogenetic investigation of meiosis and mitosis in ovarian tissue. During the last year, considerable new information was accumulated about chiasmata frequency of meiosis in female mammals and mechanisms of mutagenesis.

Members of the reproductive endocrinology group considerably expanded their work dealing with the mechanisms controlling ovarian function. Over the years, this group, under the direction of Dr. Raymond L. Vande Wiele, Professor of Obstetrics and Gynecology, has progressively grown into a sizable and truly interdisciplinary team. In addition to previous members, including Dr. Raphael Jewelewicz, Assistant Professor of Obstetrics and Gynecology, Dr. Michel Ferin, Assistant Professor of Physiology, Dr. Peter Carmel, Assistant Professor of Neurological Surgery, Dr. Earl Zimmerman, Assistant Professor of Neurology, and Mr. R. J.

Bogumil, Bioengineer, the group was recently enlarged by the appointment of Dr. C. Dominique Toran-Allerand, Assistant Professor of Neurology, and Dr. Michael Salzman, Resident in Neurological Surgery. The group also established an active collaboration with Dr. Donald Pfaff of the Rockefeller University. Two Fellows, Dr. Shigeo Araki from Japan and Dr. Ulf Schwartz, a W.H.O. trainee from Germany, work with Dr. Ferin. The work of this group, which increasingly emphasizes the study of central nervous system control over reproductive function, is discussed in the report of the Department of Obstetrics and Gynecology.

Dr. Harold Calvin, Instructor of Human Genetics and Development, continued his studies of the maturation of mammalian sperm. Evidence was obtained that the amino acid composition of human and rabbit protamins (but not of rat protamins), consists of more than one major molecular species, even when derived from a single individual. Dr. Calvin also showed that the reduction of -S-S- bonds stimulates the binding of actinomycin D to the sperm of eutherion mammals, an indication that these cross-links may inhibit access of potential mutagens to the sperm chromatin. The association of zinc with thiol groups in sperm, previously suggested by Dr. Calvin, has now been confirmed by several experimental approaches. The isolation and chemical analysis of rat sperm dense fibers has shown that these are true hard keratin which binds most of the zinc in the sperm.

Dr. Muriel Feigelson, Assistant Professor of Biochemistry, continued her studies of proteins in the female genital tract whose elaboration is under the control of steroid hormones.

Biomedical Division

The Family Life Services staff suffered considerable attrition during 1973 as a result of a drastic cutback in funds available for family planning activities. Patient group activities all but ceased, except for the weekly group sessions for community teenagers. Similarly, lack of funds made it necessary to abandon the psychiatric consultation service. Expansion of the regular family planning clinics is made difficult by the lack of space in Vanderbilt Clinic. Worst of all, the imposition of a minimum fee in the clinic has made it prohibitive for many patients to attend the family planning clinic sessions in the Vanderbilt Clinic. Even with a greatly diminished staff, it still has been possible to continue one-to-one patient education among postpartum and post abortion inpatients. Liaison still continues with the family planning and guidance clinic of the Community

League of West 159th Street, Inc. Several workshops, conferences, and programs for community residents and agencies were organized. The largest symposium was held on March 23 and 24, 1973, and was attended by approximately 400 people interested or involved in family planning work.

Clinical studies of newer contraceptive techniques continue. These include trials of the Copper-T intrauterine device and low estrogen oral contraceptives. Mrs. Dorothy Schreier (Sloane Social Service) initiated a cooperative program with the Family Life Services staff to provide group and individual discussions with patients whose problems or fears interfere with effective use of their contraceptive method. A prospective study is being conducted to assess the long-term effectiveness of reinforcement of family planning education of this type.

Drs. Richart and Robert S. Neuwirth, Professor of Clinical Obstetrics and Gynecology, continued their program directed toward development of an outpatient female sterilization technique and made significant progress in the hysteroscopic electrocoagulation approach. They also undertook limited trials using chemical agents placed in the interstitial fallopian tubes by a variety of techniques and are pursuing the design and testing of new modes of delivery for the chemical agents.

Dr. Richard Friedman, Associate in Psychiatry, developed a program for sex education of medical students. In this innovative program, sex education is integrated completely into the clerkship in Obstetrics and Gynecology. Short-term and long-term effects of this program are evaluated by a series of follow-up exams given to medical students. Dr. Friedman in addition started a study of gonadal function in male homosexuals to relate endocrine function to psychological patterns of homosexuality.

Division of Social and Administrative Sciences

Under the new administrative organization, this Division, under the direction of Dr. Samuel M. Wishik, comprises elements of two formal divisions. Although there is considerable commonality of interest and a great deal of interaction between the two groups, they maintain their identities within the new structure in order to continue the specialized kinds of activities to which they had been committed in the past. The Social Demography Section (formerly biomathematics and demography) is headed by Drs. Moni Nag and Harriet B. Presser. During 1973, the staff continued work on a number of projects started in earlier years and took on several new projects. Dr. Robert A. Lewis and staff worked on two major

studies, "Modernization and Nationality in the U.S.S.R., 1897-1970" and "Urbanization and Migration in Soviet Society," both of which entailed extensive field work in the Soviet Union. Dr. Nag's work on "The Economic Cost and Value of Children in Four Societies" made satisfactory progress with field investigations by two Columbia University Ph.D. candidates and was completed in December. Dr. Presser directed a study of the role and fertility patterns of urban mothers, focusing on the determinants and consequences of the age of the mother at first birth. In addition, Dr. Presser continued to do research in the area of contraceptive sterilization, specifically in the United States and Puerto Rico.

The first stage of the anthropological investigations in Haiti, including a complete demographic survey of one village, was completed, and the next phase, involving studies of the utilization of new health services, was launched; the development of screening procedures for family planning clinics continued, with field testing carried out in Hong Kong and New York City; and material from several prior studies on sexual alliance patterns and fertility, methods of age estimation, and family planning supervision was brought into focus, with work begun on Manuals on these subjects. The work of the Division's Evaluation Units in Ecuador and Brazil also continued. The Division library, under the direction of Kathryn H. Speert, published its *Fertility Modification Thesaurus* in April and began the initial phases of its expansion into an information center on family planning program evaluation under a new contract with U.S.A.I.D.

During 1973, the staff of the Division became increasingly involved in teaching activities, in established as well as new courses. Dr. Donald W. Helbig of the Division worked with Dr. Elinor Downs of the School of Public Health on the development of a new major track on Population and Family Health. Under Dr. Helbig's coordination, Division staff took responsibility for the population-related aspects of this track. An introductory course was taught in the spring and fall semesters and a field experience course was also launched in the fall. Dr. Nag taught a course on "Social Aspects of Human Fertility" in the Sociomedical Sciences Division of the School of

Public Health and conducted a seminar on Anthropological Demography in the Graduate School of the University. Dr. Presser taught a course on "Population and Policy" in the Division of Sociomedical Sciences of the School of Public Health in the spring semester.

Extramural Activities

Members of the Institute made many and varied contributions to national and international agencies and projects dealing with human reproduction. They served as consultants to numerous agencies, including the W.H.O., Pan American Health Organization, U.S.A.I.D., and several foreign governments. Members of the Institute lectured extensively, both domestically and abroad, and participated in a variety of symposia. Drs. Connell, Jagiello, Lieberman, Nag, Presser, Vande Wiele, and Wishik functioned as members of study sections and advisory committees and in other capacities for the National Institutes of Health and other national agencies. The International Institute started a series of workshops on problems dealing with reproductive function. Mrs. Kathy Darabi succeeded Miss Judith Anderson as Program Coordinator of these workshops. The first of the conferences dealt with the subject of biorhythms and human reproduction and was held October 3-8, 1972, at the Sterling Forest Conference Center. The proceedings of this conference have now been published. The second symposium had Sex Differences in Behavior as its topic and also was held at the Sterling Forest Conference Center, from September 30 to October 3, 1973. The proceedings of this conference are now in press.

The Institute gratefully acknowledges support for its work from the Ford Foundation, which gave a generous contribution leading to the organization of the Institute and is still its major contributor. Important support was also received from the Commonwealth Fund, the Agency for International Development, the National Institutes of Health, the Office of Economic Opportunity, World Health Organization, the Population Council, the Department of Health, Education and Welfare, New York State Department of Health, the National Foundation, and the Pan American Health Organization.

1973 Publications

International Institute for the Study of Human Reproduction

Bedford, J. M.; Bent, M. J. and Calvin, H. I.

Variations in the structural character and stability of nuclear chromatin in morphologically normal human spermatozoa. *J. Reprod. Fertil.* **33**:19, 1973.

Bedford, J. M.; Calvin, H. I. and Cooper, G. W.

Maturation of sperm in the human epididymis. *J. Reprod. Fertil.* (Suppl.) **18**:199, 1973.

Blumstein, A. and Helbig, D. W.

Impressions of the Louisiana program. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June 1972*. Ford Foundation, New York, 1973, p. 71.

Bumpass, L. L. and Presser, H. B.

The increasing acceptance of sterilization and abortion. In: *Toward the End of Growth: Population in America*. C. F. Westoff, ed. Prentice-Hall, Englewood Cliffs, N. J., 1973, p. 22.

Calvin, H. I.; Yu, C. C. and Bedford, J. M.

Effects of epididymal maturation, zinc (II) and copper (II) on the reactive sulphydryl content of rat spermatozoa. *Exper. Cell Res.* **81**:333, 1973.

Floge, L.

Additional considerations on family size in India. *J. Fam. Welfare* **19**:39, 1973.

Gorosh, M.

A Model for Planning the Motivation and Service Manpower Training Dimensions of Family Planning Programs. Ph.D. dissertation, Johns Hopkins University, 1973.

Helbig, D. W.

Physical and biological aspects. In: *Human Sexuality and the Mentally Retarded*. F. F. de la Cruz and G. D. LaVeck, eds. Brunner/Mazel, New York, 1973, p. 86.

The importance of the "soft dimensions" in training for family planning program management. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June 1972*. Ford Foundation, New York, 1973, p. 41.

Program evaluation as a management tool: Both technology and a state of mind. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June 1972*. Ford Foundation, New York, 1973, p. 239.

Moore, E. C.

Population problems from a woman's perspective. In: *Population: a Clash of Prophets*. E. Pohlman, ed. New American Library, New York, 1973, p. 437.

Induced abortion and contraception: sociological aspects. In: *Readings in Family Planning: A Challenge to the Health Professions*. D. V. McCalister, V. Thiesen, and M. McDermott, eds. C. V. Mosby Co., St. Louis, 1973, p. 102.

Abortion: Ambivalence and ambiguity. Ph.D. dissertation, Columbia University, 1973.

Nag, M.

Population anthropology: Prospects and perspectives. In: *Explorations in Anthropology: Readings in Culture, Man and Nature*. M. M. Fried, ed. Thomas Crowell, New York, 1973 (abridged version in *Population Studies* **27**:59, 1973).

Tribal-nontribal fertility differential in India. *Demography India* **2**:104, 1973.

Cultural factors affecting family planning. *J. Fam. Welfare* **9**:3, 1973.

Presser, H. B.

Perfect fertility control: Consequences for women and the family. In: *Toward the End of Growth: Population in America*. C. F. Westoff, ed. Prentice-Hall, Englewood Cliffs, N. J., 1973, p. 133.

Sterilization and Fertility Decline in Puerto Rico. University of California Institute of International Studies, Berkeley, California, 1973, p. 211. Population Monograph Series No. 13).

Reynolds, J.

The planning-operation-evaluation cycle in family planning program administration (Central America). In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June 1972*. Ford Foundation, New York, 1973, p. 179.

A Framework for the Selection of Family Planning Program Evaluation Topics. Revised ed. Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, New York, 1973.

A Framework for the Design of Family Planning Program Evaluation Systems. Revised ed. Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, New York, 1973.

Operational Evaluation of Family Planning Programs Through Process Analysis. Revised ed. Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, New York, 1973.

Scrimshaw, S. C.

A Checklist for Evaluative Overviews of Family Planning Program Activities. Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, New York, 1973.

Reynolds, J. and Ramaprasad, R.

A Method for Estimating Future Caseload of Family Planning Programs. Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, New York, 1973.

"Lo de Nosotras": Pudor Actitudes Acerca de las Clinicas de Planificacion Familiar en una Ciudad Sud Americana. Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, New York, 1973.

Speert, K. H. and Wishik, S. M.

Fertility Modification Thesaurus with Focus on Evaluation of Family Planning Programs. N.Y. , Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, 1973, 186 pp.

Wickham, R. S.; Blumstein, A.; Farley, J. and Helbig, D. W.

Improved management of family planning and population programs. In: *Readings on Family Planning and Population Program Management: Background Papers for a Ford Foundation Meeting on Population, Elsinore, Denmark, June, 1972*. Ford Foundation, New York, 1973, p. 9.

Wishik, S. M. and Chen, K.

Couple-Year of Protection: a Measure of Family Planning Program Output. Division of Social and Administrative Sciences, International Institute for the Study of Human Reproduction, New York, 1973.

Wolfers, D.

Population adventures and misadventures on the subcontinent (book review). *Family Planning Perspectives* 5:188, 1973.

Wolfers, D. and Wolfers, H.

Vasectomania. *Family Planning Perspectives* 5:196, 1973.

Wolfers, H.; Subbiah, N. and bin Mazurka, A.

Psychological aspects of vasectomy in Malaysia. *Soc. Biol.* 20:315, 1973.

Institute of Cancer Research

SOL SPIEGELMAN, *Director*

The Institute of Cancer Research continues a broad-based and multidisciplinary approach aimed at a better understanding of the cancer problem and its control. The research areas include viral oncology, immunological aspects of cancer, chemical carcinogenesis, and the regulation of cell activity.

Research Activities

Dr. Spiegelman and his associates have in the past year provided further evidence suggesting that RNA tumor viruses may be involved as etiologic agents in a wide variety of human cancers. In the previous report, the initial phases of this investigation were described. Molecular hybridization techniques were employed to detect viral-specific RNA in human breast carcinomas, leukemias, sarcomas and lymphomas. The data revealed that these human neoplasias exhibit a specific pattern of viral-related RNAs remarkably similar to that observed in the corresponding viral-induced tumors of mice.

In order to pursue further the etiologic implications of these initial findings for human cancer, it became necessary to perform experiments designed to answer the following questions concerning the viral-related RNAs identified in the human neoplasias: (1) How large is the viral-specific RNA that is being detected? (2) Is it associated with a reverse transcriptase? and (3) Are the two found in a structure possessing a known physical characteristic of an RNA tumor virus? The experimental resolution of these questions was made feasible by the development of a technique in Dr. Spiegelman's laboratory for the simultaneous detection in biological fluids of reverse transcriptase activity and associated high-

molecular-weight (70S) RNA. This procedure made it possible to demonstrate the presence in human milk of particles possessing three of the characteristics diagnostic of RNA tumor viruses (Drs. Jeffrey Schlom and Spiegelman). Subsequently this procedure was modified so that it could be applied to malignant tissue (Drs. Subhash Gulati, Richard Axel, and Spiegelman), thus permitting the simultaneous detection of 70S RNA-directed DNA synthesis in particles possessing the density characteristic of RNA tumor viruses. Thus three characteristics of viral agents known to cause cancer in animals could be readily identified in a single operation.

The simultaneous detection assay as developed for tumor tissue was first applied to human breast carcinomas (Drs. Axel, Gulati, and Spiegelman) to probe further the etiologic significance of the earlier findings in human breast carcinomas of RNA related to that of the mouse mammary tumor virus. Thirty of 38 breast adenocarcinomas examined gave clear evidence that they contained the 70S RNA and reverse transcriptase complexes, whereas all of the 10 nonmalignant controls were negative. Furthermore, the 70S RNA is physically associated with the reverse transcriptase in a particle having a density between 1.16 and 1.19 gm/ml. Finally, it was shown that the RNA of the human breast cancer particles possesses homology to the RNA of the mouse mammary tumor virus. Thus, four of the biochemical and physical features characteristic of the RNA tumor viruses have been satisfied by the particles detected in human breast malignancies.

In a similar manner, the simultaneous detection assay was also applied to human leukemic cells (Drs.

William Baxt, Rudiger Hehlmann, and Spiegelman) and human lymphomas (Drs. Donald Kufe, Hehlmann, William Peters, and Spiegelman), both of which have been shown to contain RNA possessing homology to that of the mouse leukemia agent. Ninety-five per cent of more than 60 acute and chronic leukemic cells and 81 per cent of 40 lymphoma specimens clearly contained evidence of a 70S RNA associated with a reverse transcriptase in a particle having a density between 1.16 and 1.19 gm/ml. Furthermore, the DNA synthesized by these particles proved to be related in sequence to the RNA of the mouse leukemia virus. Thus, in parallel with the findings on the breast cancer particles, four features diagnostic of agents similar to the mouse leukemia virus are also exhibited by a particle found in high frequency in human leukemic cells and human lymphomas. In contrast with these results are those obtained with a control series of 18 normal white blood samples and 14 uninvolved spleens. None of these gave evidence of particles that contain 70S RNA and reverse transcriptase.

The DNA-containing Epstein-Barr herpes virus has been implicated in the etiology of Burkitt's lymphoma, a malignant tumor of children in Africa. However, in agreement with the findings in human leukemia and other types of lymphoma, Burkitt's tumor was found to contain an RNA related in sequence to that of the mouse leukemia virus (Drs. Kufe, Hehlmann, and Spiegelman). Further, the application of the simultaneous detection assay to 15 Burkitt's tumors (Drs. Kufe, I. T. Magrath, J. L. Ziegler, and Spiegelman) demonstrated with high (87%) frequency the presence of particles containing 70S RNA and reverse transcriptase.

The fact that both the DNA herpes virus and an RNA tumor virus have been found suggests that an interaction between them may play a role in the etiology of Burkitt's lymphoma. To explore this possibility with a well defined animal model, experiments were performed (Drs. Peters, Kufe, Schlom, J. W. Frankel, C. O. Prickett, V. Groupé, and Spiegelman) using avian Marek's disease, a malignant lymphoproliferative disease associated with Marek's disease virus (MDVH), a herpes virus. Studies using the technique of controlled exposure to a contact demonstrated that tumorigenesis requires exposure to both the Marek's agent (MDVH) and avian leukosis virus RAV-2. Molecular hybridization experiments using birds similarly contact exposed also demonstrated an interaction between these two agents, thus lending support to the findings in human Burkitt's disease.

The next phase of the work in Dr. Spiegelman's laboratory was to test the proposition that the nuclear

DNA of every human cell contains whatever information is necessary and sufficient for transformation to malignancy. The necessary experiments were made possible by the already noted discovery that human leukemic cells contain particulate elements encapsulating 70S RNA and reverse transcriptase.

The human leukemic particles were used to synthesize labeled single-stranded complementary DNA copies of the particle RNA. These could be employed as a probe in DNA:DNA hybridizations (Drs. Baxt and Spiegelman) to detect complementary sequences in human normal and leukemic white blood cell nuclear DNA. Before these DNA strands could be used to detect leukemia-specific sequences, complementary sequences shared with normal and white blood cell DNA were removed by exhaustive hybridization to normal DNA in vast excess. In every case the residue was then found to react only with leukemic nuclear DNA. These results demonstrate the presence of particle-related DNA sequences in the leukemic genome that are not present in the DNA of normal cells.

This analysis was carried one step further by showing, in two sets of identical twins (Drs. Baxt, J. W. Yates, H. J. Wallace, Jr., J. F. Holland, and Spiegelman), that the leukemic member contains particle-related sequences in the DNA of his leukocytes that cannot be detected in the leukocytes of his healthy identical sibling. This implies that the additional leukemia-specific information found in the DNA of the leukemic individuals must have been inserted subsequent to fertilization. This outcome argues against any etiologic concept that invokes transmission through the germ line of one complete copy of particle-related information.

Similar DNA:DNA hybridization studies were also performed using probes synthesized from the particles detected in human lymphomas, including Burkitt's disease (Drs. Kufe, Peters, and Spiegelman). The results obtained agree with the findings in human leukemias. The nuclear DNA of the lymphomas contains particle-related sequences that cannot be detected in the DNA of normal cells. These data, with those obtained with the leukemias, suggest that one may not be forced to cope with an omnipresent DNA segment coding for malignancy. Under the circumstances, one can perhaps be more hopeful regarding pathways leading to the control and cure of cancer.

Other work in Dr. Spiegelman's laboratory has involved the use of purified reverse transcriptase for synthesizing DNA complements of a wide variety of natural RNAs. Thus given a purified RNA message, such as that for hemoglobin, the corresponding DNA genetic material has been successfully synthesized.

This work has led to a study of patients with β -thalassemia (Drs. Daniel Kacian, Roberto Gambino, Lois Dow, Elliott Grossbard, Clayton Natta, Francisco Ramirez, Spiegelman, Paul Marks, and Arthur Bank), in which specific probes for α and β mRNA were synthesized to determine whether the decreased β mRNA activity in β -thalassemia is due to the presence of abnormal or reduced β -globin mRNA in these cells. In six nonthalassemic patients, relatively equal amounts of hybridizable α and β mRNA appear to be present. In five of seven patients with β -thalassemia, significantly decreased amounts of β mRNA as compared with α mRNA quantities were demonstrated. In two patients with hemoglobin H disease, there is a decreased amount of α mRNA as compared with that of β -mRNA.

Utilizing viral RNA from Q β bacteriophage and a highly purified RNA dependent RNA polymerase preparation from Q β infected *E. coli*, Dr. Donald Mills and his colleagues have explored many aspects of RNA-directed RNA replication *in vitro*. This enzyme, here designated the replicase, was shown to mediate *in vitro* autocatalytic synthesis of infectious viral Q β RNA and to display a high template specificity for its own RNA over that of other unrelated phage RNAs.

Dr. Mills and his colleagues have since described and determined the complete nucleotide sequence of a small RNA molecule (MDV-1) which will, when provided with the four ribonucleoside triphosphate precursors, template some 2^{48} self-replications during a 30-minute incubation with the replicase. Upon examination, MDV-1 RNA is highly structured, with each RNA molecule containing as many as nine double-helical hairpins and the likelihood of considerable tertiary folding.

Dr. Philip Fiegelson's laboratory has demonstrated the presence of a soluble hepatic cytoplasmic protein which seems to serve as the physiological hormone receptor, i.e., it has high affinity for the steroid, and appropriate steroidal stereospecificity; its degree of *in vivo* saturation correlates with the level of hormonal activity *in vivo*; and the hormone-receptor complex binds to hepatic chromatin and nuclei with high specificity.

The cell-free ribosomal system derived from Krebs II ascites tumor cells has been fortified and optimized so that it efficiently catalyzes an mRNA dependent synthesis of specific proteins. Dr. Feigelson and his colleagues have isolated poly-A rich mRNA species from rabbit reticulocytes, hen oviduct, and rat liver. Employing suitable immunologic and SDS-polyacrylamide gel fractionation techniques, they have demonstrated the *in vitro* cell-free

net synthesis and release of completed radioactive protomeric polypeptides of rabbit α and β globin chains, hen ovalbumin, and rat liver tryptophan oxygenase (40,000 daltons). The latter is the first demonstration of the *in vitro* translation of the mRNA of a mammalian enzyme. Procedures were developed wherein the amount of nascent tryptophan oxygenase synthesized was proportionate to the amount of added liver mRNA. Using this assay, it was shown that the hormonally induced increase in the levels of tryptophan oxygenase *in vivo* was accompanied by parallel changes in the level of the specific mRNA coding for this enzyme protein. This finding supports the hypothesis that the steroid hormone-receptor complex interacts with the nucleus, resulting in selectively enhanced transcription of those genes coding for the inducible enzyme.

Other studies have explored the processes with which the glucocorticoid steroid hormones enhance ribosomal RNA synthesis. Among the findings are the following: (1) The isolated nucleolus contains hormonally elevated RNA polymerase I activity when measured with either endogenous or exogenous deoxynucleotide templates. (2) Pretreatment of animals with α -amanitin or cycloheximide prevents the hormonal rise in nucleolar RNA polymerase I. (3) Nucleolar-bound RNA polymerase I activity decreases rapidly following cycloheximide or actinomycin D administration. These and related findings are compatible with the view that the glucocorticoid steroids may enhance the RNA polymerase II-catalyzed transcription of nucleoplasmic genes, generating elevated levels of mRNA species which code for one or more rapidly turning over polypeptide components, which, in turn, are essential for the nucleolar binding activity of RNA polymerase I.

Drs. Jacob Furth, Gaiko Ueda, and colleagues have extended earlier work on the character of multi-hormonal activities of diverse neoplastic pituitary cells. All multi-hormonal tumors investigated followed homeostatic derangement of a single pituitary cell type.

Sustained deficiency of thyroid hormones in mice induced a transplantable neoplasm exhibiting hyperactivity in four endocrine systems: thyrotropic, gonadotropic, mammatropic, and somatotropic. By immunohistochemical staining, antithyrotropic hormone in high dilutions was found to visualize strongly normal thyrotropes; the same sera also stained normal gonadotropes, albeit rather slightly and only when applied in higher concentrations. Antigonadotropic hormone stained gonadotropes intensely, but not normal thyrotropes; however, it did stain thyrotropic tumor cells. These reactions are ex-

plained by the structural homology between these two hormones, which finds its expression in two separable antibodies in their antisera. Antisera to the hormone-specific beta subunits stained normal and tumor cells almost as specifically as the antisera to the corresponding complete hormones. The antisera to the common alpha subunits were very weak and gave negative or weak nonspecific reactions. When the dependent thyrotropic tumors acquired autonomy and were grown in normal mice, the tumor-bearing animals became giants. Marked elevation of growth hormone in sera of these mice was demonstrated by radioimmunoassays. This technique disclosed a less extensive elevation of growth hormone in sera of athyroid mice bearing dependent tumors. The sequence of events following thyroidectomy is inevitable. Hypertrophy and hyperplasia of thyrotropes is followed by development of thyroid hormone deficiency-dependent thyrotropic tumors which secrete large quantities of thyrotropin associated with biologic gonadotropic activity. This is explained by subunits shared by gonadotropin and thyrotropin. The marked rise of gonadotropin and somatotropin secretion is associated with derepression of the genetic code incidental to neoplastic transformation.

All four hormonal activities were discovered on the basis of biologic changes in the tumor hosts before they were documented by radioimmunoassays and immunohistochemical staining for the respective pituitary hormones. The hormonal changes during the course of induction and subsequent growth of mouse thyrotropic tumors and rat mammatropic tumors were studied by means of immunohistochemical staining in consecutive sections cut at 3 μ . A few cells with multihormonal activities were detected in the primary tumors; such cells were more conspicuous in the transplanted neoplasms. Neoplastic mammatropes usually had somatotropic, and less often, adrenotropic activities. These mammatropic tumors are best induced by estrogens, and the first-generation grafts are often estrogen-dependent, but in the course of subsequent passages the mammatropic activity diminishes, while the somatotropic activity invariably increases. The acquisition of adrenotropic activity is variable. One strain which has been remarkably stable during about the last 15 years has extraordinary adrenotropic activity, but immunohistochemical staining disclosed that the cells resemble mammatropes and are unlike adrenotropes, and that all three hormonal activities reside in the same cell.

Derangement of the hormonal spectrum of pituitary tumors is best related to the derepression of the

cytogenetic code of differentiated normal cells. Histologic and immunohistochemical staining studies of rat pituitaries and mammary glands solidified the hypotheses that (a) mammary tumors occurring in early adult life are due to a spontaneous neoplastic transformation of the mammary epithelial cells during puberty, and (b) that neoplasms can result from replication errors without the aid of any of the three classes of carcinogens. Cell-stimulating hormones not only enhance the action of known carcinogens, but can induce neoplastic transformation without them. The theory of Dr. Furth and his colleagues regarding neoplastic transformation without carcinogens is in line with the hypothesis that equates tumor induction to mutation and explains evolution by frequent errors in code-copying.

The laboratory of Dr. Elliott Osserman and his associates continued coordinated clinical, biochemical, and immunologic investigations of the plasmacytic and monocytic dyscrasias. The clinical activities of this group are principally described in the report of the Department of Medicine. Drs. Takashi Isobe and Osserman completed their investigations of a new variant of plasma cell dyscrasia which has been designated "deleted H and L chain disease." The abnormal proteins in this case were established to represent the complex combination of a monoclonal IgG λ serum globulin with deletions in both H and L chains, along with the production of free gamma chains (Fc fragment) and the urinary excretion of large quantities of deleted lambda chains. It was further established that the deleted lambda chains contained 26 moles of carbohydrate with an average of 2.2 moles of sialic acid per MW 15,000. The deletions of both the lambda and H chains were localized to their respective V (variable) regions and were of similar magnitudes (approximately 10,000 daltons). The estimated molecular weight of the IgG λ serum globulin was 110,000, and the MW of the deleted lambda chain was 15,000. The particular significance of these studies relates to their implications with respect to the interdependence of H and L chain synthesis in the elaboration of immunoglobulins. Since the presently available evidence in this case indicates apparently parallel deletions of the H and L chains, it is considered most unlikely that this was a fortuitous event. Detailed amino acid sequence studies of these proteins have been initiated in collaboration with Dr. Fred Garver of the Medical College of Georgia.

Drs. Osserman and Isobe pursued their investigations of clinical and experimental amyloidosis. Further evidence was obtained for a pathogenic relationship between monoclonal immunoglobulins, particu-

larly light chains (i.e., Bence Jones proteins), and the development of amyloidosis. In collaboration with Drs. George Glenner and William Terry of the National Cancer Institute, analyses of the amino acid sequences of both the Bence Jones protein and the isolated amyloid from a patient with generalized amyloidosis were carried out. These studies unequivocally establish the identity of the Bence Jones protein and the amyloid protein in this case. The basic mechanism of amyloid production presently appears to be the polymerization of soluble protein precursors through noncovalent hydrogen bonding. It was established that dimethylsulfoxide (DMSO) is effective *in vitro* in blocking this type of polymerization of light chains. On the basis of this observation, studies were undertaken to determine the effect of DMSO on experimental murine amyloidosis induced by casein. The results of these studies have been so encouraging that a clinical trial of DMSO in clinical amyloidosis has been initiated. Since this trial has been in progress for only six months, it is not yet possible to reach definitive conclusions, but there has been some evidence of clinical benefit.

Dr. Osserman and his collaborators also carried forward investigations of mammalian lysozymes. Dr. Matti Klockars succeeded in developing an immunoperoxidase-immunoglobulin bridge technique for localization of lysozyme in cells and tissues. This method was shown to have significant advantages over previously described methods for lysozyme localization. In the normal adult rat, lysozyme was demonstrated in the proximal tubules of the kidney, Paneth cells of the small intestine, and alveolar macrophages. Lysozyme was also demonstrated in macrophages in the perifollicular sinusoids of an activated lymph node. Drs. Klockars and Matteo Adinolfi also studied the ontogeny of lysozyme during fetal and perinatal life in the rat. Lysozyme was first detected in the kidneys and circulating monocytes of 18-day rat fetuses. After birth, a marked increase in the number of alveolar macrophages was observed, in association with intense lysozyme staining. The enzyme was detected in Paneth cells for the first time 8 to 12 days after birth. The functions of lysozyme are generally considered to relate primarily to antibacterial defenses although recent studies in this laboratory have indicated an effect of the enzyme on both normal and transformed mammalian cell membranes. It is therefore postulated that lysozyme may serve an important function in the surveillance and control of mammalian cells.

Dr. Osserman and his group extended their investigations of the Shay chloroleukemia in Wistar/Furth rats, which they had previously shown to produce

large amounts of lysozyme. In tumor-bearing animals, lysozyme was demonstrated to accumulate in the kidneys and to be eventually excreted in the urine. The proximal tubule cells of tumor-bearing animals developed large complex cytoplasmic droplets containing the residua of degenerated membranes. Using the immunoperoxidase method with specific anti-rat lysozyme, increased amounts of the enzyme were demonstrable in the renal tubules. Intraaortic injections of rat lysozyme in the normal rats failed to reproduce fully the structural abnormalities, indicating the probability of other contributory factors to the nephropathy observed in the chloroleukemic animals.

Drs. I Bernard Weinstein and Dezider Grunberger have continued studies on the molecular mechanism of chemical carcinogenesis. Previous evidence indicating that the liver carcinogen N-2-acetylaminofluorene (AAF) binds to guanine residues in oligonucleotides and transfer RNA to produce "base displacement" has now been extended to double-stranded DNA and RNA. The base displacement model explains the ability of AAF and related polycyclic carcinogens to act as potent frame-shift mutagens.

Further progress has been made in Dr. Weinstein's laboratory in the use of tissue culture systems to analyze the mechanism of chemical carcinogenesis. Epithelial rather than fibroblast cells have been emphasized since over 80 per cent of human tumors are of epithelial origin. Epithelial cell lines have been established from normal adult rat liver and from rat hepatomas. *In vitro* transformation of the normal cells with AAF has been achieved. Normal liver cell lines were negative for RNA virus production, even after exposure to bromodeoxyuridine (BudR), but hepatoma cell lines consistently gave evidence for production of types A and C RNA viruses. BudR treatment of the hepatoma cell lines not only increased the yield of virus but also induced the synthesis of aberrant filamentous forms. Temperature-sensitive mutants of chemically transformed cells have been obtained, and studies are in progress to determine whether RNA viruses play a causative role, or are merely intruders, in the process of hepatic carcinogenesis.

Drs. Grunberger and Weinstein have continued studies on the role of transfer RNA in differentiation and cancer. The structure of an unusual fluorescent base designated "peroxy-Y," which is present in mammalian phenylalanine transfer RNA, has been elucidated in collaboration with Dr. Koji Nakanishi (Chemistry, Morningside Heights Campus). It differs from the yeast "Y base," which this group previously characterized, by the presence of a unique

hydroperoxide group on the β carbon on the side chain. Liver phenylalanyl-tRNA synthetase has been purified 1500-fold and characterized in terms of several structural, kinetic, and substrate parameters. Evidence was obtained that *in vivo* a major fraction of this enzyme enters into complexes with microsomal membranes and ribosomes.

Drs. Grunberger and Weinstein have also elucidated the molecular mechanism of action of CCNU, a nitrosourea currently used in cancer chemotherapy. They found that this drug causes cyclohexylcarbamoylation of lysine residues in cellular proteins as well as alkylation of DNA and RNA. The bifunctional effects of this drug explain its activity against tumors which are resistant to conventional alkylating agents. Dr. Weinstein has collaborated with Dr. Edward Housepian and others in the Neurological Institute in the evaluation of the nitrosoureas in the treatment of malignant brain tumors. Preliminary results suggest that the combination of radiotherapy with CCNU is more effective than radiotherapy alone in the treatment of these tumors.

Extramural Activities and Honors

Dr. Spiegelman was the recipient of the Papanicolaou Award for Cancer Research, the City of Hope Biomedical Research Award, the Intra-Science Research Foundation Medal, the Hofstra University Distinguished Scholar Award, and the Honorary Doctor of Laws from the University of Glasgow, Scotland. He gave invitation plenary lectures at the International Congress of Biochemistry on July 7 in Stockholm, and at the International Genetics Congress on August 27 in Berkeley, California. He continues to serve on the National Cancer Advisory Board. He was Shell Lecturer at the University of California, Davis; F. F. Nord Lecturer in Biochemistry at Fordham University; Mellon Lecturer at the University of Pittsburgh; and Daniel Laszlo Memorial lecturer at Montefiore Hospital.

In the past year, Dr. Osserman was invited lecturer at the Saratoga Conference on Molecular Biology, the University of South Carolina, the Medical College of Georgia, the American Society of Hematol-

ogy, and the U.S. Military Academy. He served on the National Cancer Institute's Cancer Research Center Review Committee and was a member of the Board of Scientific Advisors, Institute for Cancer Research, Philadelphia. He was the recipient of the Distinguished Alumni Award of the Horace Mann School.

Dr. Weinstein was appointed an advisor to the Chemistry and Molecular Biology Segment of the National Cancer Institute and continues to serve as a member of the Pharmacology B Study Section of the National Institutes of Health. He chaired a discussion group on the use of tissue culture techniques at the National Academy of Sciences-National Research Council Conference on Carcinogenesis Testing in the Development of New Drugs, gave the 1973 Sigma Xi Lecture at Clemson University, and presented numerous lectures on carcinogenesis at universities throughout the United States.

Dr. Furth was elected to honorary membership in the American Association for Cancer Research and received the Alessandro Pascoli Prize at the Fifth Perugia International Conference on Cancer. He was appointed to the Breast Cancer Experimental Biology Committee of the National Cancer Institute and participated at the International Conference on Human Prolactin in Brussels, Belgium.

Dr. Grunberger lectured at the 9th International Congress of Biochemistry in Stockholm.

Acknowledgments

The Institute gratefully acknowledges the support of the American Cancer Society, American Cancer Society (N.Y.C. Division); George Crocker Special Research Fund; Community Chest of Alpine, N. J.; Damon Runyon Memorial Fund for Cancer Research; Health Research Council of the City of New York; Hoffman-LaRoche, Inc.; Leukemia Society of America; National Institutes of Health; National Science Foundation; Alma Toorock Memorial for Cancer Research, Inc.; The Zelda Radow Weintraub Cancer Fund; and the Anne Winton Cancer and Service League.

1973 Publications

Institute of Cancer Research

- Axel, R.; Gulati, S. C. and Spiegelman, S.
Particles containing RNA-instructed DNA polymerase and virus-related RNA in human breast cancers. *Proc. Nat. Acad. Sc. (USA)* **69**:3133-3137, 1972.
- Baxt, W.; Hehlmann, R. and Spiegelman, S.
Human leukaemic cells contain reverse transcriptase associated with a high molecular weight virus-related RNA. *Nature* **240**:72-75, 1972.
- Baxt, W. G. and Spiegelman, S.
Nuclear DNA sequences present in human leukemic cells and absent in normal leukocytes. *Proc. Nat. Acad. Sc. (USA)* **69**:3737-3741, 1972.
- Baxt, W.; Yates, J. W.; Wallace, Jr., H. J.; Holland, J. F. and Spiegelman, S.
Leukemia-specific DNA sequences in leukocytes of the leukemic member of identical twins. *Proc. Nat. Acad. Sc. (USA)* **70**:2629-2632, 1973.
- Beato, M. and Feigelson, P.
Glucocorticoid binding proteins of rat liver cytosol. I. *J. Biol. Chem.* **247**:7890-7896, 1972.
Separation and identification of the binding protein.
- Beato, M.; Kalimi, M., Konstam, M. and Feigelson, P.
Interaction of glucocorticoids with rat liver nuclei. II. Studies on the nature of the cytosol transfer factor and the nuclear acceptor site. *Biochemistry* **12**:3372-3378, 1973.
- Blobstein, S.; Grunberger, D.; Weinstein, I. B. and Nakanishi, K.
Isolation and structure determination of the fluorescent base from bovine liver phenylalanine transfer ribonucleic acid. *Biochemistry* **12**:188-192, 1973.
- Brady, F. O. and Feigelson, P.
Photoactivation of pseudomonad L-tryptophan oxygenase by electron ejection from its substrate, L-tryptophan. *Arch. Biochem. Biophys.* **156**:745-750, 1973.
- Brady, F. O.; Feigelson, P. and Rajagopalan, K. V.
Studies on the copper and heme cofactors of pseudomonad L-tryptophan-2,3-dioxygenase by electron paramagnetic resonance spectroscopy. *Arch. Biochem. Biophys.* **157**:63-72, 1973.
- Cuatco, W.; Cho, J.-R. and Spiegelman, S.
Particles with RNA of high molecular weight and RNA-directed DNA polymerase in human brain tumors. *Proc. Nat. Acad. Sc. (USA)* **70**:2789-2793, 1973.
- Farhangi, Mehdi and Osserman, Elliott, F.
Treatment of multiple myeloma. *Seminars Hemat.* **10**:149-161, 1973.
- Feldman, S. P.; Schlom, J. and Spiegelman, S.
Further evidence for oncornaviruses in human milk: The production of cores. *Proc. Nat. Acad. Sc. (USA)* **70**:1976-1980, 1973.
- Feigelson, P.; Brady, F. O. and McCray, J. A.
Allosteric modulation of the transient kinetics of carboxy tryptophan oxygenase complex formation after laser flash photolysis. *J. Biol. Chem.* **248**:5267-5271, 1973.
- Fenoglio, Cecilia; Ferenczy, Alex; Isobe, Takashi and Osserman, Elliott, F.
Hepatoma associated with marked plasmacytosis and polyclonal hypergammaglobulinemia. *Am. J. Med.* **55**:111-115, 1973.
- Furth, J.; Martin, J. M.; Moy, P. and Ueda, G.
Growth hormonal activity of thyrotropic pituitary tumors. *Proc. Soc. Exper. Biol. & Med.* **142**:511-515, 1973.
- Furth, J.; Moy, P.; Schalch, D. S. and Ueda, G.
Gonadotropic activities of thyrotropic tumors: Demonstration by immunohistochemical staining. *Proc. Soc. Exper. Biol. & Med.* **142**:1180-1184, 1973.
- Furth, J.; Moy, P.; Hershman, J. M. and Ueda, G.
Thyrotropic tumor syndrome: A multiglandular disease induced by sustained deficiency of thyroid hormones. *Arch. Path.* **96**:217-226, 1973.
- Grunberger, G.; Yu, F. L.; Grunberger, D. and Feigelson, P.
Mechanisms of N-hydroxy-2-acetylaminofluorene inhibition of rat hepatic RNA synthesis. *J. Biol. Chem.* **248**:6278-6281, 1973.
- Harter, D. H.; Axel, R.; Burny, A.; Gulati, S.; Schlom, J. and Spiegelman, S.
The relationship of visna, maedi and RNA tumor viruses as studied by molecular hybridization. *Virology* **52**:287-291, 1973.
- Hehlmann, R.; Baxt, W.; Kufe, D. and Spiegelman, S.
Molecular evidence for a viral etiology of human leukemias, lymphomas, and sarcomas. *Am. J. Clin. Path.* **60**:65-79, 1973.
- Kalimi, M.; Beato, M. and Feigelson, P.
Interaction of glucocorticoids with rat liver nuclei. I. Role of the cytosol proteins. *Biochemistry* **12**:3365-3371, 1973.
- Koblinsky, M.; Beato, M.; Kalimi, M. and Feigelson, P.
Glucocorticoid binding proteins of rat liver cytosol. II. Physical characterization and properties of the binding proteins. *J. Biol. Chem.* **247**:7897-7904, 1972.
- Kufe, D.; Hehlmann, R.; Peters, W. P. and Spiegelman, S.
Evidence for the involvement of RNA tumor viruses in human lymphomas including Burkitt's disease. *Lepetit Colloquium, Cocoyoc, Mexico*, 153-167, 1973.
- Kufe, D.; Hehlmann, R. and Spiegelman, S.
RNA related to that of a murine leukemia virus in Burkitt's tumors and nasopharyngeal carcinomas. *Proc. Nat. Acad. Sc. (USA)* **70**:5-9, 1973.
- Kufe, D.; Magrath, I. T.; Ziegler, J. L. and Spiegelman, S.
Burkitt's tumors contain particles encapsulating RNA-instructed DNA polymerase and high molecular weight virus-related RNA. *Proc. Nat. Acad. Sc. (USA)* **70**:737-741, 1973.

- Nowinski, R. C.; Watson, K. F.; Yaniv, A. and Spiegelman, S.
Serological analysis of the DNA polymerase of avian oncornaviruses. II. Comparison of avian DNA polymerases. *J. Virol.* 10:959-964, 1972.
- Orenstein, J. M. and Weinstein, I. B.
Filamentous forms of type C particles in cell cultures from chemically induced rat hepatomas. *Cancer Res.* 33:1998-2004, 1973.
- Osserman, Elliott F.; Klockars, Matti; Halper, James and Fischel, Robert E.
Effects of lysozyme on normal and transformed mammalian cells. *Nature* 243:331-335, 1973.
- Peters, W. P.; Kufe, D.; Schlom, J.; Frankel, J. W.; Prickett, C. O.; Groupé, V. and Spiegelman, S.
Biological and biochemical evidence for an interaction between Marek's disease herpes virus and avian leukemia virus *in vivo*. *Proc. Nat. Acad. Sc. (USA)* 70:3175-3178, 1973.
- Ruprecht, R. M.; Goodman, N. C. and Spiegelman, S.
Conditions for the selective synthesis of DNA complementary to template RNA. *Biochim. Biophys. Acta* 294:192-203, 1973.
Determination of natural host taxonomy of RNA tumor viruses by molecular hybridization: Application to RD-114, a candidate human virus. *Proc. Nat. Acad. Sc. (USA)* 70:1437-1441, 1973.
- Schlom, J.; Colcher, D.; Spiegelman, S.; Gillespie, S. and Gillespie, D.
Quantitation of RNA tumor viruses and virus-like particles in human milk by hybridization to poly A sequences. *Science* 179:696-698, 1973.
- Schlom, J.; Michalides, R.; Kufe, D.; Hehlmann, R.; Spiegelman, S.; Bentvelzen, P. and Hageman, P.
A comparative study of the biologic and molecular basis of murine mammary carcinoma: A model for human breast cancer. *J. Nat. Cancer Inst.* 51:541-551, 1973.
- Schlom, J. and Spiegelman, S.
Breast cancer: Molecular probing for a viral etiology. In: *Pathobiology Annual* 1973. H. L. Joachim, ed. Meredith Corporation, New York, 1973, pp. 269-290.
Evidence for viral involvement in murine and human mammary adenocarcinoma. *Am. J. Clin. Path.* 60:44-56, 1973.
- Schmall, B.; Cheng, C. J.; Fujimura, S.; Gersten, N.; Grunberger, D. and Weinstein, I. B.
Modification of proteins by 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea (NSC 79037) *in vitro*. *Cancer Res.* 33:1971-1974, 1973.
- Schutz, G.; Beato, M. and Feigelson, P.
Isolation of eukaryotic messenger RNA on cellulose and its translation *in vitro*. *Biochim. Biophys. Res. Comm.* 49:680-689, 1972.
Messenger RNA for hepatic tryptophan oxygenase: Its partial purification, its translation in a heterologous cell free system and its control by glucocorticoid hormones. *Proc. Nat. Acad. Sc. (USA)* 70:1218-1221.
- Spiegelman, S.; Axel, R.; Baxt, W.; Gulati, S. C.; Hehlmann, R.; Kufe, D. and Schlom, J.
Human cancer and the RNA tumor viruses. In: *RNA Viruses/Ribosomes, (FEBS Symposium)*. North-Holland Publishing Co., Amsterdam, 1972, pp. 73-99.
Molecular evidence for a viral etiology of human cancer. In: *Proc. 7th Nat. Conference on Human Cancer, Los Angeles, September, 1972*. J. P. Lippincott, Philadelphia, 1973, pp. 21-40.
The relevance of RNA tumor viruses to human cancer. In: *Sixth Miles International Symposium on Molecular Biology*, Chapter 21, 1973, pp. 282-312.
- Spiegelman, S.; Kufe, D.; Hehlmann, R. and Peters, W.P.
Evidence for RNA tumor viruses in human lymphomas including Burkitt's disease. *Cancer Res.* 33:1515-1526, 1973.
- Terry, William D.; Page, David L.; Kimura, Shigeru; Isobe, Takashi; Osserman, Elliott F. and Glenner, George G.
Structural identity of Bence Jones and amyloid fibril proteins in a patient with plasma cell dyscrasia and amyloidosis. *J. Clin. Invest.* 52:1276-1281, 1973.
- Tscherne, J. S.; Weinstein, I. B.; Lanks, K. W.; Gersten, N. B. and Cantor, C. R.
Phenylalanyl-tRNA synthetase activity associated with liver ribosomes and microsomes. *Biochemistry* 12:3859-3865, 1973.
- Tscherne, J. S.; Lanks, K. W.; Salim, P. D.; Grunberger, D.; Cantor, C. R. and Weinstein, I. B.
Studies on rat liver phenylalanyl-tRNA synthetase. II. Further purification, substrate specificity and effects of substrates on heat inactivation. *J. Biol. Chem.* 248:4052-4059, 1973.
- Ueda, G.; Moy, P. and Furth, J.
Multihormonal activities of normal and neoplastic pituitary cells as indicated by immunohistochemical staining. *Internat. J. Cancer* 12:100-114, 1973.
- Watson, K. F.; Nowinski, R. C.; Yaniv, A. and Spiegelman, S.
Serological analysis of the DNA polymerase of avian oncornaviruses. I. Preparation and characterization of monospecific antiserum with purified DNA polymerase. *J. Virol.* 10:951-958, 1972.
- Weinstein, I. B.
Editor, *Cellular Organelles as Targets of Carcinogens*. Interdisciplinary Communications Program, Smithsonian Institution, Washington, D. C., 1973.
Editor, *Cellular Targets of Carcinogens*. Interdisciplinary Communications Program, Smithsonian Institution, Washington, D. C., 1973.
- Weinstein, I. B.; Gebert, R.; Stadler, U. C.; Orenstein, J. M. and Axel, R.
Type C virus from cell cultures of chemically induced rat hepatomas. *Science* 178:1098-1100, 1972.

Institute of Comparative Medicine

ROSS M. GREY, D.V.M.

Curator of Animal Husbandry and Chairman of Institute of Comparative Medicine

The Department provided the central animal care facilities for 115 investigating teams, involving veterinary care and animal husbandry for 49,463 animals of 21 species. Consulting services were provided to the investigators of the Medical Center including those at Delafield Hospital, Psychiatric Institute, and Eye Institute. Veterinary consultation was also provided to St. Luke's Hospital and Brookdale Medical Center, both Columbia affiliates.

With Dr. John Budinger, pathologist for Lawrence Hospital and consulting pathologist for the New York Zoological Society, the Department conducted an elective seminar in comparative pathology for the Department of Pathology. Discussed in this seminar were common biological disease processes in humans and animals and naturally occurring animal diseases which serve as models for study of human diseases. A field trip was made to the Animal Medical Center to acquaint students with a veterinary hospital and the type of services offered.

The Department also taught two hours of laboratory animal medicine in the School of Dentistry's

course in research methodology.

The chairman continued to serve on the advisory council for the Animal Science Department of the State University Agricultural and Technical School at Delhi, New York, as treasurer of the New York Society for Medical Research, and as a consultant for a National Institutes of Health contract given to the University of California, San Francisco Medical Center, to develop a training program for entry-level animal technicians.

Dr. Domenico Agostino left the Department in June to become veterinarian for the Institute of Cancer Research at Delafield Hospital.

Mr. Robert McGrath, a graduate in laboratory animal science from the State University of New York at Delhi, joined the staff as veterinary technician in September.

The Department continues to operate under the Laboratory Animal Welfare Act of 1970 (Public Law 9-579) and is accredited by the American Association for the Accreditation of Laboratory Animal Care.

Institute of Human Nutrition

MYRON WINICK, *Director*

Teaching, Changes in the Staff, Honors, and Curriculum

Dr. Myron Winick, Professor of Pediatrics and Director of the Institute, was appointed as the R. R. Williams Professor of Nutrition. Continuing are Theodore B. Van Itallie, Professor of Medicine, as Associate Director; and Jo Anne Brasel, Associate Professor of Pediatrics, as Assistant Director and Chief of the Division of Growth and Development. Medical school faculty participating in this Division are Drs. Winick, Robert Winters, William Heird, Ruth C. Harris, and Pedro Rosso, newly appointed Assistant Professor of Pediatrics. Dr. Rawle McIntosh resigned.

The Division of Nutrition and Metabolism, located both at St. Luke's Hospital Center and Columbia-Presbyterian Medical Center, is under the direction of Dr. Van Itallie. The St. Luke's staff consists of Drs. Sami A. Hashim (in charge), Robert S. Bernstein, Susanne Bennett-Clark, F. Xavier Pi-Sunyer, and Phienvit Tantibhedhyangkul. Participants in the Columbia-Presbyterian unit are Drs. DeWitt Goodman, John M. Kinney, Richard S. Rivlin, Frank Smith, and John E. Smith.

Miss Bess Miller, Staff Associate for the Division of Community Nutrition, who resigned to enter medical school, was replaced by Miss Gloria V. Moore, R.N., and 1973 M.S. graduate of the Institute. Other faculty participants in the Division are Drs. Elinor F. Downs, Michael Katz, Cherry Low-

man, F. Xavier Pi-Sunyer, David Rush, W. H. Sebrell, and Mervyn W. Susser.

In addition to his new professional appointment, Dr. Winick was appointed to the Committee on Nutrition of the American Academy of Pediatrics and to the Advisory Board of MEDICO as a representative of the Academy. He was the lecturer on nutrition at the 30th Annual Brennemann Memorial Lectures of the Los Angeles Pediatrics Society on September 19-20, 1973. He was editor of the first volume in the new series *Current Concepts in Nutrition*. Numerous presentations were made by Dr. Winick at national and international meetings during the year.

Dr. Jo Anne Brasel was elected secretary-treasurer of the Society for Pediatric Research; she also served on the Nominating Committee of the American Society for Clinical Nutrition. She made 11 presentations at national and international meetings during the year. Dr. Sami A. Hashim participated in the Fogarty International Conference on Obesity held at the National Institutes of Health. Dr. F. X. Pi-Sunyer was elected to the membership of the Endocrine Society and to the 1974-75 chairmanship of the Clinical Society of the New York Diabetes Association; he was an invited speaker at the 1973 International Congress of Diabetes. Dr. Robert S. Bernstein was an invited speaker at the 4th International Meeting of Endocrinology at Marseille. Dr. Rivlin was elected to the membership of the American

Institute of Nutrition and made 15 major presentations including papers at the Annual Meetings of the Endocrine Society, the FASEB meetings in Atlanta, Georgia; and the Association of Official Chemists and the Symposium on Childhood Obesity in New York City.

All autumn classes and seminars of the Institute now meet on the Medical Center campus, and the spring classes and seminars will be conducted at the St. Luke's location. Biostatistics courses will be replaced by special studies in biostatistics incorporated into other courses being taught during the spring term. New courses of study are being designed especially for doctoral candidates in nutrition, and the Institute has made plans to receive candidates in the new M.D./Ph.D. program of the College of Physicians and Surgeons.

The teaching of nutrition in the Medical School is progressing. Nutrition is offered as an elective, and a series of lectures on nutrition has become a part of the Public Health rotation. The William H. Sebrell Fellowship Fund provided summer fellowships for Raymond Azzi and Francis X. Mendoza, first-year medical students who joined ongoing nutrition projects in the Division of Growth and Development and the Division of Nutrition and Metabolism, respectively. Beginning in September 1974 the Institute will provide the nutrition component for M.P.H. candidates in the two-year Master's program of the School of Public Health.

Twenty-six persons (including four physicians from abroad) are enrolled in the 1973-74 U.S. program, which represents an increase of 15 over last year's enrollment. There are 10 persons in the Ph.D. program and one candidate for the D.P.H. who is under the sponsorship of the Institute.

Members of the Steering Committee of the Doctoral Program Subcommittee on Nutrition of the Graduate School of Arts and Sciences are Drs. Max A. Eisenberg (Biochemistry), David Schachter (Physiology), Elliott P. Skinner (Anthropology), Van Itallie, and Winick (chairman).

In cooperation with the School of International Affairs' Institute of African Studies and Institute of Latin American Studies, the courses "Nutrition in Black Africa" and "Nutrition in Latin America" were offered in the spring and autumn terms of 1973, respectively.

Sixty-three students from other divisions of the University and Teachers College chose electives offered by the Institute during the 1972-73 academic year.

Other Activities

The second in a series of international symposia on nutrition, Symposium on Childhood Obesity, was conducted in New York on November 15-16, 1973. Attendance was about 1,000 persons including all students and fellows of the Institute. The November 1974 symposium will deal with nutrition and the aging.

Research

Division of Growth and Development

Areas of research interest of the Division include the effects of maternal malnutrition and placental insufficiency on fetal growth and placental transfer of nutrients, the effects of vitamin A deficiency on fetal growth and retinol binding protein, the biochemical changes in liver accompanying the "catch-up" growth associated with nutritional rehabilitation, the effects of parenteral nutrition on brain growth, the biochemical changes in adipose tissue during growth and nutritional alterations, and the effects of malnutrition on polyamines during growth and development.

Division of Nutrition and Metabolism

St. Luke's Hospital Center

Areas of research interest include metabolism and clinical use of medium-chain fatty acids and triglycerides, the activity of acetyl CoA carboxylase in the liver and odd-carbon fatty acid-enriched animals during starvation, isolation of platelets from patients with hyperlipoproteinemia, metabolic and hormonal response to 2-deoxyglucose in patients with complete cervical cord transection, insulin response to various secretagogues in patients with impaired adrenergic tone, the effect of leucine and its derivatives on insulin secretion in rats, the relationship of hexokinase isoenzymes to insulin sensitivity in adipose tissue incubated *in vitro*, and the effect of dietary carbohydrate content on adipose tissue metabolism in obese patients. (See also the Department of Medicine's report.)

Division of Nutrition and Metabolism

Columbia-Presbyterian Medical Center

Additional research in nutrition and metabolism involves investigation of vitamin A, vitamin D, riboflavin and cholesterol in health and disease (as discussed in the Department of Medicine's report).

Division of Community Nutrition

Several major projects are being conducted, including continuation of the "Slimmy Clubs" (weight

reduction programs) in Harlem Public Schools, instruction in nutrition for the elderly at the Varrick and JFK Community Center in Harlem, a course for employees of the Day Care Programs in Washington Heights, study of the development of Korean war orphans malnourished in their infancy and later adopted into American homes, and the teaching of the Nutrition component of the nurse practitioners course given by the Department of Pediatrics and the School of Nursing in the Center for Community Health Systems.

1973 Publications

Institute of Human Nutrition

- Bernstein, R. S.; Grant, N.; Crespin, S. and Kipinis, D. M.
Altered fat cell metabolism in endogenous hypertriglyceridemia (Abstract). *Clin. Res.* 20:541, 1972.
- Brasel, J. A.
Newer tools for the diagnosis of malnutrition. *Pediat. Ann.* 2:18, 1973.
- Brasel, J. A.; Jasper, H. G. and Winick, M.
Influence of hormones on cell growth. In: *Dietary Lipids and Postnatal Development*. C. Galli, G. Jacine and A. Pecile, ed. Raven Press, New York, 1973.
- Fazekas, A. G.; Menendez, C. E. and Rivlin, R. S.
A new assay for riboflavin in human urine based upon competitive protein binding. *J. Clin. Invest.* 52:27a, 1973.
- Goodman, DeW. S.
Vitamin A transport in man and the rat. In: *Dietary Lipids and Postnatal Development*. C. Galli, G. Jacine and A. Pecile, ed. Raven Press, New York, 1973.
- Goodman, DeW. S.; Noble, R. P. and Dell, R. B.
Three-pool model of the long-term turnover of plasma cholesterol in man. *J. Lipid Res.* 14:178-188, 1973.
- Jasper, H. D. and Brasel, J. A.
Effects of growth hormone on DNA polymerase activity in the liver of normal and hypopysectomized rats. *Endocrinology* 92:194, 1973.
Influence of hormones on cell growth. *Pediat. Ann.* 2:46, 1973.
- Kim, S. and Pi-Sunyer, F. X.
Preservation of beta-cell insulin secretory response to glucose during starvation in odd-chain fatty acid enriched rats (Abstract). *Diabetes* 22:305, 1973.
- McConnell, R. J.; Menendez, C. E.; Henkin, R. I. and Rivlin, R. S.
Defects in taste and smell as common clinical abnormalities in hypothyroidism. *Clin. Res.* 21:498, 1973.
- Menendez, C. E.; Hacker, P. S.;
Sonnenfeld, M., McConnell, R. J. and Rivlin, R. S.
Glutathione reductase activity in hypothyroidism: Evidence for deficiency of riboflavin *in vivo*. *Program, Endocrine Society*, p. A 156, 1973.
- Muto, Y.; Smith, F. R. and Goodman, DeW. S.
Comparative studies of retinol transport in plasma. *J. Lipid Res.* 14:525-532, 1973.
- Park, D. H. and Hashim, S. A.
Effect of starvation and refeeding on the activity of propionyl-CoA carboxylase in rat liver (Abstract). *Fed. Proc.* 32:898, 1973.
- Permutt, M. A.; Kelly, J. J.; Bernstein, R. S.; Siegel, B.; Alpers, D. H. and Kipinis, D. M.
Alimentary hypoglycemia in the absence of gastrointestinal surgery. *New England J. Med.* 288:1206, 1973.
- Pi-Sunyer, F. X.
Resistance to starvation-induced ketosis in rats enriched with odd-chain fatty acids (Abstract). VIII Congress of the International Diabetes Federation, International Congress Series, 280, *Excerpta Med.*, 1973, p. 88.
- Rosso, P.; Diggs, J. and Winick, M.
Changes in alkaline ribonuclease activity during compensatory renal growth. *Proc. Nat. Acad. Sc.* 70:169, 1973.
- Rivlin, R. S.; Huang, Y. P. and Chaudhuri, R.
Thyroid hormone enhancement of flavin synthesis in newborn rat brain. *Fed. Proc.* 32:321, 1973.
- Rosso, P.; Nelson, M. and Winick, M.
Changes in cellular RNA content and alkaline ribonuclease activity in rat liver during development. *Growth* 37:143, 1973.
- Rosso, P. and Winick, M.
Relation of nutrition of physical and mental development. *Pediatric Annals* 2:33-43, 1973.
- Rush, D.
The Columbia study. In: *Nutritional Supplementation and Outcome of Pregnancy*. H. Jacobson and M. Winick, ed. National Academy of Sciences, Washington, D. C., 1973, pp. 73-81.
- Sigulem, D. M.; Brasel, J. A.; Velasco, E. G.; Rosso, P. and Winick, M.
Plasma and urine RNase as a measure of nutritional status in children. *Am. J. Clin. Nutrition* 26:793, 1973.

Donors 1973

The support of the following is gratefully acknowledged: Campbell Institute for Food Research; Coca Cola Company; General Mills Foundation; H. J. Heinz Company; Grant Foundation; National Institutes of Health; Agency for International Development; National Dairy Council; Erma T. Hirschl Trust Grant; National Foundation; Nutrition Foundation; Hoffmann-LaRoche; Gerber Products; Norman Jolliffe Fellowship; St. Luke's Fellowship Grant; and W. H. Sebrell Scholarship Fund.

- Smith, F. R.; Goodman, DeW. S.; Arroyave, G. and Viteri, F.
Serum vitamin A, retinol-binding protein, and prealbumin concentration in protein-calorie malnutrition. II. Treatment including supplemental vitamin A. *Amer. J. Clin. Nutrition* **26**:982, 1973.
- Smith, F. R.; Goodman, DeW. S.; Zaklama, M. S.; Gabr, M. K.; Maraghy, S. E. and Patwardhan, V. N.
Serum vitamin A, retinol-binding protein, and prealbumin concentration in protein-calorie malnutrition. I. A functional defect in hepatic retinol release. *Amer. J. Clin. Nutrition* **26**:973-981, 1973.
- Smith, J. E.; Milch, P. O.; Muto, Y. and Goodman, DeW. S.
The plasma transport and metabolism of retinoic acid in the rat. *Biochem. J.* **132**:821-827, 1973.
- Smith, J. E.; Muto, Y.; Milch, P. O. and Goodman, DeW. S.
The effects of chylomicron vitamin A on the metabolism of retinol-binding protein in the rat. *J. Biol. Chem.* **248**:1544-1549, 1973.
- Van Jaarsveld, P. P.; Edelhoof, H.; Goodman, DeW. S. and Robbins, J.
The interaction of human plasma retinol-binding protein with prealbumin. *J. Biol. Chem.* **248**:4698-4705, 1973.
- Velasco, E. G.; Brasel, J. A.; Sigulem, D. M.; Rosso, P. and Winick, M.
Effect of vascular insufficiency on placental RNase activity. *J. Nutrition* **103**:213, 1973.
- Warner, V. D.; Warner, A. M.; Woods, S. C.; Vasselli, J. R., Deche, E. and Pi-Sunyer, F. X.
Leucine and its derivatives as potential elicitors of insulin secretion in rats. *J. Pharmaceut. Sc.* **62**:1186-88, 1973.
- Winick, M.
Relation of nutrition to physical and mental development. In: *Bibl. "Nutr. Diet."* J. C. Somogyi, ed. S. Karger, Basel, 1973.
- Winick, M. and Brasel, J. A.
Nutrition and cell growth. In: *Modern Nutrition in Health and Disease*. R. S. Goodhart and M. E. Shils, ed. Lea & Febiger, Philadelphia, 1973.
- Winick, M.; Brasel, J. A. and Rosso, P.
Nutrition and cell growth. In: *Nutrition and Development*. M. Winick, ed. Interscience Publishers, New York, 1973.
- Winick, M.; Brasel, J. A. and Velasco, E. G.
Effects of prenatal nutrition upon pregnancy risk. *Clin. Obst. & Gynec.* **16**:184, 1973.
- Winick, M. and Rosso, P.
Nutritional effects on brain DNA and proteins. In: *Dietary Lipids and Postnatal Development*. C. Galli, G. Jacine, and A. Pecile, ed. Raven Press, New York, 1973.

Medical Library

C. LEE JONES

Medical Librarian

Four events set this year apart from all others in the history of the Columbia University Medical Library: (1) the retirement of Professor Thomas P. Fleming, Head, Medical Sciences Division, after 35 years of service with the Columbia University Libraries; (2) the ground breaking for the Augustus Long Library—Health Sciences Center; (3) the institution of an automated reference service known as MEDLINE; and (4) a more technical event, the definition of a Medical Library collection policy.

Untiring in his efforts to maintain the high quality of the Columbia University Medical Library, Fleming was a teacher of high quality and personal advisor to many librarians, not only in this country but internationally. He leaves behind a tradition of scholarship and service to library users; a collection which he built and strengthened through the years and a staff well schooled in his philosophy of librarianship and service. Fleming will be missed, not only in the Medical Library, but throughout the field of medical librarianship. Late in the year it was announced that Mr. C. Lee Jones, Director of the Medical Library at The University of Texas Medical Branch at Galveston, had been appointed Medical Librarian. He will assume his post effective the beginning of fiscal year 1973/74.

On April 11, 1973, ground was broken for the Augustus Long Library—Health Sciences Center at the corner of 168th Street and Fort Washington Avenue. After months of planning in which every member of the staff participated, the plans for the new library facility were completed. The "fast track"

system of construction is being employed in which shell construction proceeds as internal construction decisions are made. Considerable pressure is exerted upon those participating in the project because of the short time for decision making.

MEDLINE (MEDLARS on line), an automated data base providing rapid access to a large portion of the world's medical literature, was installed in the Library in June 1973. It is expected that MEDLINE will eventually have a tremendous impact upon medical reference services.

One of the most important events of this year was an internal operation in which the Medical Library carefully defined its collection policy—that is, the specific areas in which the Library will collect have been identified as to depth and scope. This operation reflects the realization that medical libraries cannot collect every piece of medical literature, and the consequent need to refine the collection policy carefully enough to sustain the objectives of the Medical Library and at the same time make optimal use of limited funds.

The Collection

In all, 8,248 volumes were added to the Medical Library collection and 1,946 volumes withdrawn, resulting in a net gain of 6,302 items. The collection now numbers 324,274 volumes. Inflation and devaluation of the dollar resulted in cancellation of 40 journal subscriptions. However, it was necessary to subscribe to 17 journals not previously taken. At the end of June 1973 the Library was receiving 4,308 current serial titles.

It has long been obvious that continued growth cannot take place within the confines of the library's present quarters. Consequently, remote storage facilities have been a way of life for several years. As in the past, material has been withdrawn and placed on permanent deposit with the Medical Library Center of New York. This year 4,200 items were so deposited.

In preparation for the move to the new library, material stored in remote storage facilities needs to be evaluated. With the help of every professional member of the Library staff, this process was begun during the year and a substantial amount of material was found not within the Library's scope and transferred to other Columbia University Libraries. This continued collection evaluation will proceed as the move to the new building draws nearer. Nothing will be moved, it is hoped, that is not appropriate for the Columbia University Medical Library's collection.

Gifts continue to flow into the Library from faculty, alumni, commercial organizations, and other libraries. A total of 27,971 pieces (including bound issues) was received during the year, representing a slight decrease from 1972. Such gifts often enhance the collection and make it possible for the library to retain second copies of heavily used material. Sincere appreciation is extended to all who sent gifts throughout the year.

The organization of new material entering the Medical Library is in the hands of the Cataloging staff. This past year 2,327 monograph volumes and 477 serial titles were added to the collection. Not only does space for books and serials to be shelved vanish; space for catalog cards is also at a premium. This past year an additional card catalog unit was purchased in order to relieve crowding of the rest of the card catalog units. The quality of the Medical Library's card catalog is widely recognized. Few medical libraries maintain such extraordinary bibliographic control over their collections.

The collections are organized for one purpose, that is, the support of the teaching, research, and patient care functions of the Center. In spite of cramped, crowded, unpleasant, conditions, use of the collection continues to increase. Well over 100,000 people passed through the doors of the library during the last year, removing more than 65,000 items and using within the Library some 83,000 or more items. Total collection use thus approached 150,000 items during the last year. It is unfortunate that over one third of the materials circulated outside of the library facility became overdue before they were returned. It is even more unsettling to note that over 1,000 items have been identified as missing from the collection in the

1972/73 fiscal year. Plans to attack these two problems will be formulated over the course of the coming year.

One of the means to reduce pressures on the collection's circulation is to provide easy, inexpensive duplicating services. A Xerox unit has been located outside the library specifically for library users. The cost is generally ten cents per copy, except for certain medical students, for whom a subsidy is available. More than 116,000 copies were made during this fiscal year even though the facility was located outside the library. It is expected that location of these services within the Library will increase the use of the service and reduce the amount of material circulated outside the Library.

The collection will continue to grow in spite of our fixed and inadequate space. It is likely that a small amount of additional shelving will become available during the coming year and that the removal of little used material from priority space will provide enough room for the collection to grow until the move to the new Augustus Long Library.

Reference Services

In August 1972, Ms. Karen Hall was appointed Head, Medical Reference Section. In October, Dr. Charles King of the Reference Section resigned to accept the position of Assistant Librarian at the Harlem Hospital Library. Mr. Dennis Lampkowski, a library school student at Columbia, assumed responsibility for many of the routine tasks in the Reference Section, thus freeing professional time for literature searching, in depth reference, instruction, and the like.

As noted above, MEDLINE came to the Medical Library this year. Ms. Ellen Schwartz of the Reference Section was sent to the National Library of Medicine for a three-week MEDLINE training course. Prior to the arrival of the Library's computer terminal, Ms. Schwartz used a terminal in the Department of Pediatrics to train other librarians in the use of the MEDLINE system.

The Library's Bibliographic Service continues to function effectively, with 22 searches ongoing. The Bibliographic Service is an alerting reference service calling attention of subscribing faculty to appropriate literature in their fields.

The reference staff continued to give lectures on the use of, and access to, medical literature to various groups of students and faculty and to give orientation tours of the Library upon request. The staff began to utilize audiovisual material in their lectures and plan expanded use of these media in the future.

Despite the limited space for exhibits, the refer-

ence staff prepared an exhibit on "Psychopathology and Pictorial Expression" (in cooperation with the Library of the Psychiatric Institute). Dr. John K. Lattimer, Chairman of the Department of Urology, exhibited historical items concerning Benjamin Franklin and Abraham Lincoln. It is not expected that additional exhibits will be prepared prior to moving to the new Augustus Long Library.

The Medical Library continues to be a resource for libraries in the immediate region, as well as to provide unique materials to libraries throughout the country and, occasionally, internationally. Thus, 181 libraries were served in this manner. As strong as the Library is, however, it cannot fulfill every request. Consequently, resource help is sought from other libraries, particularly the New York Academy of Medicine, the Medical Library Center of New York, and the National Library of Medicine. Columbia relies most heavily upon these three institutions to provide material not present in its own collection.

The Facilities

In the past, as the collection grew, it was necessary to shift the collection from one shelving configuration to another. As already noted, the past year was no exception. One major shift, to occur in the next fiscal year, will probably provide sufficient room so that no additional shifts will be required before the move to the new facility. Library users have been discommoded not only by uncertainties due to continual collection shifts but also by the not infrequent need to rearrange seating and study facilities. Accommodations for the library staff are as inadequate as those for the collection and library users. The staff faces in the coming year a series of shifts which, it is hoped, will enhance service capabilities and provide more functional operating space.

Near the end of the fiscal year the National Library of Medicine notified the University that a proposal to establish a Prototypical Multimedia Facility had been approved and funded. This program provides for creation of a Multimedia Center in which students, staff, and faculty can be exposed to the possibilities of media materials in health science education. The former Reserve Reading Room is being renovated for this purpose.

The program thus being initiated is part of the process of developing operating plans for the new Augustus Long Library. There is an institution-wide commitment to see that the new library facility will provide every opportunity for integrating a variety of media formats into the University's teaching programs. In a sense, the entire facility will be a demonstration project for the University as a whole. Major

commitments of space and resources have been made within the new library to accommodate various media technologies in a variety of teaching environments. At the same time, the traditional library function have not been ignored. For the first time in many years, the entire Medical Library collection will be brought together and made once again accessible to the teaching and research staff of the institution. The coming year will see modifications and refinements of the building plans, but the decisions and commitments which will bear fruit only several years hence were made during this past year.

Affiliated/Related Libraries

Neurological Institute Library

The Epilepsy Abstract Retrieval System was phased out by the Special Progress Branch of the National Institute of Neurological Diseases and Stroke, and thus the Library no longer has access to this data base. An expanded data base for this experimental system was under consideration when it was determined that it could no longer be funded.

A diminished funding base for the Library reduced monograph purchasing in order to maintain journal subscriptions and the binding program.

The Library now houses an audiovisual carrel equipped with a slide projector, a cassette audio player and a video cassette playback unit. The carrel is being used heavily by both students and faculty. An attempt is being made to evaluate the use of the carrel as well as the utility of the programs made available.

Harlem Hospital Center Library

A freeze on personnel vacancies was lifted during the past year, allowing the addition of Dr. Charles L. King as Reference Librarian to the Libraries' personnel roster. Collection development continued to receive a high priority. The use of the Library has increased dramatically and the processing of a cataloging backlog has nearly been completed.

International Institute for the Study of Human Reproduction—Division of Program Development and Evaluation Library

The publication of the *Fertility Modification Thesaurus* and the award of a contract to develop a computerized information retrieval system highlighted the year for the Library. Over 700 descriptors have been included in the Thesaurus and have been "fitted" into the National Library of Medicine's Medical Subject Headings (MeSH). The contract to develop the computer based information service is a joint effort with the George Washington

University Population Information Program (PIP). The Library continues to enter documents into the data files and so expands a valuable data base.

Institute of Cancer Research and Francis Delafield Hospital Library

In spite of severe budget problems the core collection of the Delafield Hospital Library continued to be developed. The reference services of this Library are considerably enhanced by the provision of an SDI (Selective Dissemination of Information) service which is well received by library users. The usual orientation tours and lectures to Delafield staff were continued. Plans for interior rearrangement for more efficient library service have been made and will probably be implemented during the coming fiscal year.

Extramural Activities of the Professional Staff

Miss Cecile E. Kramer, Assistant Librarian, and until the coming of Mr. Jones the Senior Officer of the Medical Library, was extremely active outside the Library as well as within. She taught the Medical Library Association Continuing Education course, "Human Factors in Medical Library Administration," in Kansas City as well as in the New York area. She served as Vice-Chairman, Chairman Elect, and member of the Executive Committee of the New York Regional Group of the Medical Library Association; Secretary of the Ad Hoc Committee to Review the Goals and Structure of the Medical Library Association; member of a Task Force on Acquisi-

tions of the Associated Medical Schools of New York and Northern New Jersey; and member of the Advisory Committee of the New York and Northern New Jersey Regional Medical Library and member of the Sub-Committee for the Direction and Projection of the Regional Medical Library Advisory Committee. Within the Columbia University Libraries she was a member of the Task Force on Professional Position Classification and a member of the Medical Library Building Planning Committee. Miss Kramer's leadership has provided inspiration and direction for the Library staff through this past year.

Miss Hall was a member of the New York Regional Group of the Medical Library Association's Scholarship Committee; Dr. King was a member of the New York Regional Group, Medical Library Association Program Committee, as was Miss Ellen Schwartz, who was also a member of Columbia University's Professional Advisory Committee. Dr. Vera Ortynsky was a member of the Task Force on Technical Services of the Associated Medical Schools of New York and Northern New Jersey; a member of the Hospitality Committee of the New York Regional Group of the Medical Library Association; and a consultant to Bowker's *Medical Books in Print 1972*.

The past year was difficult but the staff of the Medical Library has accepted challenge without losing sight of their primary purpose—to join library users and the information they seek. The inadequacies of space have not inhibited the progressive thinking of the staff. The year indeed has marked a turning point toward brighter, more productive, and useful days.

Center for Community Health Systems

JOHN H. BRYANT, *Director*

The Center for Community Health Systems (C.C.H.S.), established in January, 1972, is an interdisciplinary and interdepartmental program of the Faculty of Medicine. Its purpose is to enlist the substantial and varied resources of the University, jointly with the Faculty of Medicine and its affiliated teaching hospitals, in a systematic attack on the problems of organization and delivery of health care, with a predominant focus on urban areas.

The Center itself does not assume responsibility for providing medical care. Rather, it serves as a research and development resource, identifying health care issues and the researchable problems associated with them and participating in the identification, design, implementation, and evaluation of alternative patterns of resource organization and health service delivery arrangements.

An interdisciplinary approach to the problems of health care delivery is emphasized. It is felt that efforts within one discipline—historically the norm in health research—have fallen short of substantial advances in many applications, because these efforts result in a single view of a problem. It has been the Center's purpose to fill the gap between potential and accomplishment in this area.

Executive Committee and Staff

The Center's Executive Committee continues to be chaired by Dr. George I. Lythcott, Associate Dean of Urban and Community Health Affairs at P&S. Two new members of the Committee are Dr.

Charles Ashley, Administrator of Mary Imogene Bassett Hospital in Cooperstown, N. Y. and Dr. Lowell Bellin, Director of the Division of Health Administration in the School of Public Health. Mr. Charles Windsor, Executive Director of Harlem Hospital Center, has replaced Mr. Elliot Roberts, the former Executive Director of Harlem.

Internally, the Center is organized according to Projects and Areas. Each project has a director who draws from the interdisciplinary staff the persons needed to pursue the project. Certain subject matter areas, such as statistical studies, health economics, community interaction, and sociomedical studies have directors and staff. There is flexibility in the use of staff—an individual may be a director of one project and a working member of another. As on going projects have been expanded and work begun in new areas, faculty members of the School of Public Health and other disciplines have joined the Center, devoting 50 to 100 per cent of their time and new staff have been recruited.

A number of staff members have been added during the past year. Ann Brunswick, Senior Research Associate in the Division of Sociomedical Sciences is Area Leader for Sociomedical Sciences for the Center. Her current work is in adolescent health and the application of the behavioral sciences to problems of health and social behavior. Dr. Stanley Budner, Associate Professor of Sociomedical Sciences, has joined C.C.H.S. as Project Leader for the study of the health care needs of the elderly. Dr.

Holger Hansen, Assistant Professor of Epidemiology, brings epidemiological concepts and techniques to that study. André Varma, M.D., Associate Professor of Biostatistics, will contribute a combination of medical, statistical, and computer backgrounds to Center projects. Also from the School of Public Health is Geraldine Widmer, who holds an M.P.H. in Research Methodology and is working on problems of the elderly and assisting in the development of a health profile for the Upper West Side of Manhattan. Carol Tarica, a former staff associate with the Harlem Adolescent Care Project, is working on data in the adolescent and primary care studies.

Other new members of the C.C.H.S. staff include Dr. Catherine De Angelis, a pediatrician with an M.P.H. and an R.N. who is currently working on the development of the Nurse Practitioner Program. Daniel Denerstein, who is assisting with the Child Health Project, has an M.P.A. and a background in social work and health research. Dr. Brant Fries, last year a postdoctoral fellow in Operations Research at the Center and now a full-time staff member and Assistant Professor at the School of Public Health, is interested in medical information systems and modeling of clinic scheduling systems. The Center's Community Interaction Area is headed by Victoria Garvin, who has had many years of experience as an organizer and activist in civil rights, housing, employment, and consumer interests. She is assisted by Judith Wicks, who came to the Center from the Office of Urban and Community Health Affairs at P&S. Purlaine Lieberman, a consultant to the Center, is a biostatistician working on the study of public health expenditures in New York City. Dr. Margaret Olendzki, a sociologist and health care researcher with a Ph.D. from the University of London, is Project Director of the Center's work on community hospital-related ambulatory care. John Philips, the Administrative Assistant for the Center, has a background in business management at various educational and research institutions.

C.C.H.S. Projects

The Center's research program is organized primarily around interdisciplinary projects, with the bulk of these projects devoted to ambulatory care. Most projects adopt as a principal focus a particular target group of the total population in upper Manhattan, such as children, the elderly, or the poor, and attempt to deal with the general needs and particular problems of that target group. This approach is appropriate, because much of the health care resources and many needs and problems are particular to each of these groups. On the other hand, since some health

care resources are shared by more than one group (e.g., emergency rooms by the elderly and the poor), coordination among projects is necessary. The main objective of the C.C.H.S. projects is to improve health care to these target groups through a better understanding of their needs and desires, and through improvements in health care delivery by specific providers, including the development and coordination of certain "network" functions among providers and health care agencies. For example, area-wide planning, telephone consultation systems, transportation, and inter-provider medical record systems are functions which will require joint action among providers. The primary target area is upper Manhattan, but work is carried out with a view toward the wider applicability of the results in both research and demonstration projects.

Studies and Innovations in Child Health Care

The Child Health Care Project, a joint effort of the Center and the Department of Pediatrics, has as its goal improvement of child health care in upper Manhattan. The project is concerned with the design and implementation of approaches through which the Columbia-Presbyterian Medical Center and its affiliated hospitals can contribute to the improvement and coordination of community pediatric services. A preliminary planning effort has identified key health care problems and has led to a proposal for a group of interrelated programs.

The studies already carried out by the Center have documented some of the problems of child health care in upper Manhattan. Programs are planned that include a reorganization of the Pediatric Outpatient Department, the formation of linkages between Presbyterian Hospital and other providers of health care, and an emphasis on educating physicians and nurse practitioners who are oriented to the delivery of primary health care services.

The planned reorganization of the pediatric outpatient facility has three components: a revised walk-in unit utilizing pediatric nurse practitioners, a pediatric telephone consultation service, and a group practice module for an enrolled population. The target population of these three programs comprises those children who currently are using Presbyterian Hospital services.

Three programs have been designed that will build linkages between the various health care providers in Washington Heights. A computerized child health information system is planned which will monitor the health status of children in Washington Heights and provide for transfer of medical data between child health stations, Presbyterian Hospital, and two

schools. A demonstration school health program is proposed, as is the postgraduate education of community physicians and pharmacists. Facilitation of referral to the Presbyterian Hospital by community physicians and Health Department physicians is expected. Presbyterian Hospital will also serve as a back-up facility for a neighboring child health station that is to provide treatment as well as preventive services.

Programs are planned to educate physicians and nurses for future roles in primary care of children, for example, the Nurse Practitioner Program and a medical student education program that emphasizes primary care and an understanding of the health care system.

Improving Health Services to the Elderly and the Poor

A recent foundation grant will permit the Center to undertake some initial steps in contributing to improvements in health care to two important population groups in upper Manhattan—the elderly and some sectors of the poor, including the near poor. The project will focus on the most pressing ambulatory health care needs, such as accessibility, cost, and acceptability. A principal focus will be to promote relationships among providing agencies which can meet health needs more effectively and efficiently than the current fragmented, uncoordinated collection of resources. Two key ingredients of the efforts will be an attempt to strengthen organization and management at the principal sources of care and an effort to promote an area-wide planning and evaluation capability. In addition, the foundation has encouraged the Center to explore the relationships between the medical needs of these populations and other health-related problems, such as housing, transportation, and education.

Emergency and Primary Care

Many of the basic concepts and some of the data contained in the initial planning of the above projects grew out of the Center's study of Emergency and Primary Care in upper Manhattan. This study was the first step in a program aimed at improving the effectiveness, efficiency, accessibility, and acceptability of institutionally based emergency and primary health care. It consisted of a retrospective sample of over 2,000 patient visits to the Emergency Rooms in the five Columbia-affiliated hospitals. The sample disclosed many of the same patterns of utilization found in other studies. In addition, it lent support to a number of hypotheses: A relatively small proportion of patients accounts for a large proportion

of the visits; a large number of the visits end in a referral to another facility, usually within the same hospital; and the minimum levels of health personnel and facilities required to deal with most patients' problems are considerably less than those currently in use in these emergency rooms.

A number of other specific projects have been undertaken as an outgrowth of the preceding studies.

The seemingly high number of visits per episode of illness evidenced in the early studies of hospital emergency rooms has led to study of a subsample of all patients in the Medical Admitting Emergency Service of Vanderbilt Clinic whose visits ended in a referral to the outpatient department. The objective is to determine the effects of alternative primary care arrangements within the hospital on the total management of episodes of illness. Early results support the hypothesis that there are significant numbers of revisits, many of which are unnecessary, with duplication of effort and high cost.

The Center has been asked to assist a local neighborhood health center, affiliated with a major teaching hospital, in gaining an understanding of its patients' utilization patterns and of the reasons why many of its registered patients have not visited the center in the last 18 months. Early results of a medical record sampling and a patient interview sample confirm the hypothesis that most visits are motivated by episodic illnesses but nevertheless are by appointment. Despite the heavy load on the health center, a significant amount of preventive care is being delivered. The sample also shows that if a patient elects to receive the initial comprehensive examination he is more likely to be a regular user of the Center. As in hospital emergency rooms a small number of patients accounts for a disproportionate share of the visits.

A number of the potential organizations and patient flow schemes for improving the operations of hospital-based ambulatory care clinics involve new and untested methods of controlling the entry of patients into the system. The Center is in the process of postulating a number of queuing and scheduling methods and testing them by means of analytic and simulation models.

The rapid increase in the number of patients requiring care for acute trauma, the escalating costs of this care, and the gap between what is known about coping with these problems and what has been put into practice have led to a joint exploration with the Department of Surgery of potential improvements. A basic premise of these studies is that the total health care incident, from point of entry into the system to entry into routine care or to discharge,

needs to be taken into account in conducting studies and considering changes.

The assistance of the Center to Mary Imogene Bassett Hospital has continued in the form of studies of patient care operations and consultation in planning the Hospital's long-term role in the surrounding region. Largely as a product of these joint efforts, a full-time planner for the Hospital has been recruited. The new planner will assume an increasing share of planning responsibilities, and the Center will continue to be available as a resource.

Analyses of New York City Health Care Data

Three studies designed to examine and analyze New York City health care data and to provide resource material for other projects of the Center are currently in progress.

The Center's Area for Sociomedical Sciences is undertaking an analysis of the interrelationships in adolescent health status, health attitudes, and health behavior.

A health profile of Upper Manhattan is being developed, containing demographic information, health and health care utilization data, and the like. When completed, this "fact book" should prove useful as a source of information to providers and consumers involved in health care planning in Upper Manhattan, as well as to Center staff.

Also ongoing is a study of public and private expenditures for personal health care services in New York City in 1961, 1966, and 1971. This study examines changes in the scope, characteristics, and role of public expenditures for personal health services in New York City that occurred in the decade of the sixties. It attempts to assess the impact of Federal legislation and extensive administrative changes in municipal health agency organization on distribution of public health benefits among different sectors of the population by age, income, and place of residence, as well as on changes in expenditures by source of funds and object of expenditure. The general purpose of this study is to lay a basis for assessing strategies that might be employed to enhance the public sector's contribution to health in this and other metropolitan communities.

Community Hospital-Related Ambulatory Practices

A major health care foundation is planning a nationwide program to encourage the development of community hospital-related ambulatory care practices. The foundation has asked the Center to prepare a monograph describing the current situation in this subject area, analyzing the central issues involved in setting up such arrangements, and sug-

gesting alternative models. The Center will call on experts in various areas to prepare chapters on topics such as financing and costs, administration and management, facilities design and location, medical records, evaluation and monitoring, and related matters. Center staff and consultants will visit a number of relevant examples across the country and will single out a few for in-depth description and analysis. Center staff will then integrate the writings and site reports into recommendations and alternative models for consideration by potential participants in the foundation program.

Teaching Activities

The Center's primary focus is on research and development. It is also designed, however, to include substantial involvement in educating and training health personnel through the incorporation of education components in research projects and by activities of its members in educational programs.

September, 1973, marked the admission of the first class of students to the Pediatric Nurse Practitioner Program, developed and operated by the Center in collaboration with the School of Nursing and the Faculty of Medicine.

Most Center staff members are actively engaged in teaching activities in the School of Public Health and other faculties, having responsibility for courses, lectures, and preceptorships.

Other educational activities have been undertaken by the Center itself. Students from the School of Public Health have taken electives and tutorials in the Center, working as team members on specific problems. During 1972-73, the C.C.H.S. also offered residencies to two candidates for the M.P.H. degree, Claire Gutkin and Debra Feldman. In addition, two students have been hired on a part-time or summer basis—Arthur Gober, a doctoral candidate in Operations Research at the Columbia School of Engineering, and Mary Kane, formerly a senior at Barnard College with competence in computer programming and currently a first-year student at P&S. Seminars are conducted at the Center, and when appropriate, invitations are extended to other members of the University faculty. Center staff are also participating in the development of curricula for proposed undergraduate programs in the allied health professions.

Community Interaction

Under the direction of Victoria Garvin, the Center's Community Interaction area has been expanding the Center's contacts with community organizations in the geographical area served by the five affiliated hospitals. Within the past year, local groups have

been consulted on the development of the Emergency Services and Child Health Care Projects. In the Emergency Services Study, community groups contributed significantly to the final form of the project, and many valuable suggestions were presented to improve the Child Health Care proposal. Staff members regularly attend meetings of groups concerned with community health issues and assist them, where possible, with their respective programs.

The C.C.H.S. is pursuing a policy of establishing effective and on-going relationships, formal and informal, on a variety of levels, with community organizations in Upper Manhattan concerned with health care. Indeed, a working relationship has already been established with several such organizations to promote cooperation and interchange in regard to the various activities undertaken by the

Center. Efforts are under way to strengthen this relationship.

Funding

The Center continues to utilize its basic funding in the form of a three-year grant of \$1,550,000 from the Carnegie Foundation, the Commonwealth Fund, and the Rockefeller Foundation, though at a somewhat reduced rate as new grants are received. During this year, the Center was awarded a nine-month child health care planning grant of \$147,000 from the Robert Wood Johnson Foundation; a two-year \$452,000 grant from the Edna McConnell Clark Foundation for studies of health care for the elderly and the poor; and a \$23,000 grant from the New York Community Trust for a Pediatric Nurse Practitioner education program.

1973 Publications

Center for Community Health Systems

Brunswick, Ann

Adolescent health in Harlem—A special summary and follow-up. *Pub. Health Notes (P.H.A.N.Y.C.)* 11:4-8, 1973.

Adolescent health in Harlem. In: *High School Health Fairs*. New York Life Insurance Co. New York, 1973.

Adolescent health, sex and fertility (Abstract). In: *Dokumentation: Sozialmedizin öffentlicher Gesundheitsdienst Arbeitsmedizin*; 5:322, 1973. May, 1973.

Bryant, John H.

Obstacles to change in medical education. *World Med. J.* 20:33-36, 1973.

Health manpower planning in the changing scene of the 1970's. *Mt. Sinai Med. J.* (New York) 40:576-591, 1973.

International trends toward the humanization of health services. *J.A.M.A.* 224:1772-1775, 1973.

Ginsberg, Allen S.

Diagnostic process viewed as a decision problem. In: *Computer Diagnosis and Diagnostic Methods*. John A. Jacquez, ed. Charles C. Thomas, Springfield, Illinois, 1972, pp. 203-240.

Hartsook, Rosa; Angus, G. D. and Bloom, Robert

Structured job descriptions for occupational therapy. *Am. J. Occup. Ther.* 26:424-433, 1972.

Bryant, John H. and Ginsberg, Allen S.

Analysis and Development of a Child Health Care System in an Urban Area. (Prepared for the 44th National Meeting of the Operations Research Society of America, San Diego, November, 1973.) Center for Community Health Systems, New York, 1973.

Cohen, Susan; Gorman, Sheila and Loewenstein, Regina

Unscheduled Visits to Four New York City Columbia-affiliated Hospitals. Center for Community Health Systems, New York, 1973.

Cancer Research Center

PAUL A. MARKS, *Principal Investigator*

RICHARD A. RIFKIND, *Program Coordinator*

The Cancer Research Center of the Columbia-Presbyterian Medical Center was established in the fall of 1972 in order to coordinate and support the activities of faculty members engaged in basic and clinical research in cancer, as well as in the education of health professionals in cancer biology and clinical practice. These activities, designed to elucidate the biology of neoplastic growth and rapidly to translate this into clinically effective modalities of detection, diagnosis, treatment, and rehabilitation for the cancer patient, demand closely integrated, cooperative efforts of elements from many departments and clinical services of the Medical Center. The Cancer Research Center is intended as a vehicle to accomplish this objective by enlisting the many broad-based and interdisciplinary talents of the faculty and by providing, through its core facilities and research support, an exemplary environment for cancer research.

Organizationally, the Center has a nondepartmental structure, cutting across disciplinary lines by means of its Scientific Sections, which, at present, comprise four major research areas. These are: Cancer Causation, Cancer Therapy, Hormones and Neoplastic Cell Growth, and Patient Care Development. A section on Tumor Immunology and another on Cancer Detection and Control are under development. All the Scientific Sections are supported, in part, by a Core Program Section, which provides administration and central facilities.

Core Program

Drs. Richard A. Rifkind and John S. Kovach serve, respectively, as Section Chief and Deputy Sec-

tion Chief of this division of the Center. In addition to general administrative functions the Core provides several essential Center services. Under the guidance of Dr. Kovach, the *Clinical Facilities* of the Cancer Research Center have been developed for both inpatient and outpatient services. Oncology consultations are provided to all services by the clinical staff and patients are entered on clinical protocols when appropriate. A clinical inpatient research facility is currently under construction on P.H. 4 East, with partial support from the National Cancer Institute. When completed, this unit will provide facilities for optimal care of patients receiving treatment for neoplastic disease and under study by the staff of the Cancer Research Center. During this year, in addition, a central cancer clinic within the Vanderbilt Clinic has been inaugurated, designed to provide cancer diagnosis as well as chemotherapy, radiotherapy, surgical follow-up, and rehabilitation for patients at the Medical Center referred to the Cancer Research Center clinical staff.

Data Processing and Statistical Services are provided by Drs. William A. Bauman and André O. Varma, who are engaged in cooperative studies in leukemia epidemiology (Dr. Curnen), breast cancer therapy (Drs. Kister and Haagenson), prostatic carcinoma (Dr. Lattimer and staff), brain tumors (Drs. Housepian and Brisman), and pediatric leukemia (Dr. Wolff and staff). Dr. Frederick B. Putney and Dr. Mehdi Farhangi are cooperating in the development of a computer-based graphic and tabular patient clinical profile data retrieval system for the use of the cancer physician to expedite clinical care and

research in the natural history of neoplastic disease. At present, the extensive Multiple Myeloma clinical experience accumulated by Dr. Elliot Osserman is being used as the pilot model for system development.

Two *Central Tumor Tissue Facilities*, one for General Pathology under the direction of Drs. Robert Pascal and Donald W. King, and the other for Neuropathology, under Dr. Philip E. Duffy, have been instituted. These facilities are equipped and staffed to obtain, process, and temporarily store normal and tumor tissues for the research efforts of participants in the Cancer Research Center.

The *Educational Program* of the Center, under the guidance of Dr. I. Bernard Weinstein, Deputy Coordinator for Education, has emerged as a program which will coordinate existing cancer-related educational activities, as well as develop several new educational programs designed to increment the quality of cancer care and cancer research among the faculty of the Medical Center, the affiliated Columbia hospitals, and the practitioners and lay public of the neighboring community. Notable among educational activities in oncology is the Institute of Cancer Research Lecture Series at the Francis Delafield Hospital, now in its fifteenth year and under the supervision of Dr. Weinstein. The invited speakers are distinguished scientists whose research is fundamental to problems in oncology.

Cancer Therapy

Drs. Frederic P. Herter and Arthur Bank, respectively Section Chief and Deputy Section Chief, have coordinated the clinical and basic research activities of several participating units. Drs. James Wolff and Anneliese Sitarz have participated in cooperative chemotherapy protocols of the Children's Cancer Study Group A studying new therapeutic regimens for acute leukemia as well as solid tumors. Response rates of up to 93 per cent in the induction of remission in children with acute lymphocytic leukemia have been reported. Among the solid tumors, neuroblastoma, rhabdomyosarcoma, Ewing's sarcoma, and Wilm's tumor have been studied intensively. Dr. Arthur Bank and the Adult Hematology Staff have continued to participate actively in clinical trials of combination chemotherapy in adult lymphocytic and myelogenous leukemia and chronic myelogenous leukemia, as well as in Hodgkin's and non-Hodgkin's lymphomas. With Drs. Elliot Osserman and Mehdi Farhangi, the use of combination chemotherapy for multiple myeloma has also been studied. Dr. John S. Kovach, with Drs. Robert DeBellis, David Kitchin, Lionel Grossbard, James Brown, and George Hyman,

has instituted several active protocols for solid tumor chemotherapy in adults. With Dr. Sven Kister, a cooperative program for managing patients with breast carcinoma, including adjuvant chemotherapy, radiotherapy, hormonal and other chemotherapeutic modalities, has been instituted.

Dr. Edgar Housepian, with the collaboration of Dr. Ronald Brisman, continues the long-term studies of the Brain Tumor Study Group. During the year, studies were conducted designed to evaluate the efficacy of nitrosourea compounds in treatment of glioblastoma, with particular attention to the development of regional-blood-flow-determination techniques which increment the value of angiographic studies for the evaluation of chemotherapy. Dr. Edward B. Schlesinger has conducted experimental studies employing brain scan techniques to assess the response to chemotherapy. These studies on animal models are intended to correlate specific cytopathology with brain scan data and to develop criteria for clinical evaluation.

Drs. Frederic P. Herter and Paul LoGerfo with the collaboration of Dr. S. Bennett have continued studies designed to evaluate the significance of tumor-associated antigens for diagnosing several neoplasms and for evaluating the response to therapeutic maneuvers including surgery and chemotherapy.

Causation

Dr. Sol Spiegelman and Dr. I. Bernard Weinstein have supported the activities of this section as Section Chief and Deputy Section Chief, respectively. These activities comprise a broad-based program concerned with: (1) identifying etiologic factors in human cancer, and (2) identifying molecular, biochemical, ultrastructural, and cellular mechanisms fundamental to neoplastic transformation. The research programs are organized into four divisions which include: Viral Studies, Chemical and Radiation Carcinogenesis, Tumor Cell Pathophysiology, and Epidemiology.

Viral Studies

The laboratory of Dr. Sol Spiegelman has been engaged in studies designed to provide evidence for the presence of RNA tumor viruses in a variety of human tumors. Using the "simultaneous detection" assay for tumor virus RNA and reverse transcriptase, developed in this laboratory, studies have been successfully undertaken on human leukemia, lymphoma, and breast carcinoma, providing major leads toward the identification of viral agents in human carcinogenesis.

Dr. Paul A. Marks, with Drs. Richard A. Rifkind

and George Maniatis, has studied the effects of virus-induced neoplastic transformation on the regulation of proliferation and differentiation of hemopoietic precursor cells. The model system in these studies is the Friend leukemia virus-transformed mouse erythroid precursor cell, which can be induced to initiate differentiation toward red blood cells under experimental conditions.

In vitro transformation by oncogenic viruses has generally been accepted as an experimental model of virus-induced neoplasia. In order to test this formulation, Dr. Harold Ginsberg has developed a series of temperature-sensitive strains of oncogenic adenovirus which permit precise experimental evaluation of the relationship between transformation of cells in culture and the malignancy of virus-transformed cells in the intact animal.

Chemical and Radiation Carcinogenesis

In an attempt to gain insight into the mechanisms of chemical carcinogenesis, Drs. I. Bernard Weinstein and Dezider Grunberger have continued studies on the structural and functional changes in nucleic acids which occur following interaction with several known carcinogens. With Dr. Koji Nakanishi (Chemistry) they have examined the changes in tRNA structure which accompany tumor formation. In order to expand studies on carcinogenesis, this laboratory has worked to establish several new cell culture lines which can be used to examine differences between normal and carcinogen-induced tumor cells *in vitro*. The relationship between transformation under these conditions and the appearance of oncogenic C-type RNA viruses is now under study.

The studies of Dr. Harald Rossi in the Radiation Research Laboratory are designed to establish a quantitative connection between the spatial and temporal pattern in which radiation is absorbed and the biological effects, including carcinogenesis, that are produced in cells. Especially productive collaborative studies have been established which make use of several major facilities, including the neutron-generating van der Graaff accelerator facility at Brookhaven National Laboratory, neutron beam facilities at Texas A & M, and the Naval Research Cyclotron (Washington, D. C.), as well as the Princeton Particle Accelerator capable of accelerating high-energy charged nuclei. With Dr. E. J. Hall and Mrs. J. Novak, Dr. Rossi has studied the relative biological effectiveness of monoenergetic neutrons on cultured mammalian cells. In addition, the biological effects of accelerated high-energy charged nuclei are under study in order to establish the cellular response to the high-density ionization achieved by this radiation

modality. With Dr. A. M. Kellerer studies have continued to develop the theory of dual radiation action which predicts the relative biological effectiveness of various ionizing radiations. On the basis of microdosimetry, it is now predicted that tumor induction is dependent upon the action of radiation on more than one contiguous cell. Dr. E. J. Hall has been engaged in a study of the man-made nuclide Californium-252, which has considerable potential as a substitute for radium in radiotherapy. Dr. Carmia Borek has investigated the induction by x-rays of neoplastic transformation of cells in culture. These studies provide promising leads for the study of radiation carcinogenesis.

Experimental studies to define the etiologic role and mechanisms whereby ultraviolet radiation induces cutaneous neoplasms are in progress in the laboratory of Drs. Leonard Harber and David R. Bickers. Using hairless mice in which single doses of irradiation result in tumor formation, this laboratory is studying both the dose-response characteristics and the cytopathology of ultraviolet-induced neoplasia.

Pathophysiology

Dr. Philip Feigelson, with Dr. Dezider Grunberger, has explored the biochemical effects of a hepatic carcinogen on gene expression, in particular, investigating the problem of the site of action of the carcinogen at DNA template or RNA polymerase. Evidence to date indicates a carcinogen-induced impairment of DNA template function as the mechanism of this carcinogen effect.

Extensive study of retinoblastoma, at the clinical and laboratory levels, has been pursued by Drs. Robert Ellsworth and David Kitchin. Criteria for the clinical distinction of retinoblastoma from certain cases of tuberous sclerosis have been developed in collaboration with Dr. Patricia Crumrine (Neurology), and these criteria permit the assignment of appropriate therapeutic programs. The large population of patients with retinoblastoma (over 1000 cases) followed by this group has been subjected to genetic study, and over 100 sibships have been analyzed. These studies indicate the possible chromosomal locus for predisposition to the tumor. Preliminary data suggest the need to explore possible viral agents as participating in the initiation of retinoblastoma in susceptible children. Evidence which suggests that children with retinoblastoma may also be genetically predisposed to develop other primary neoplasms in later life has also been accumulated.

Studies designed to determine whether antigen-antibody complexes contribute to the renal disease observed in certain cancer patients ("cancer nephri-

tis") have been undertaken by Dr. Robert R. Pascal. Current investigations are intended to ascertain whether tumor-associated antigen-antibody complexes can be detected by their deposition on the glomerular basement membrane.

Dr. John S. Kovach has undertaken experiments intended to examine the regulation of synthesis and enzymic function of aminoacyl-tRNA synthetases from normal and transformed cells. The long-range goal of these studies is the development of novel therapeutic modalities based upon unique metabolic properties of malignant cells. In a similar vein, Dr. Dean L. Engelhardt has examined the mechanisms regulating the activity of elongation factor I (EF1) critical to protein synthesis, in normal and malignant cells. Present evidence suggests that EF1 activity is regulated in relation to cell growth in normal cells but not in transformed cells, and the relationship between this feature and the abnormal growth properties of malignant cells is under study.

Epidemiology

Dr. Mary G. McC. Curnen has continued her studies on the epidemiology of childhood leukemia, analyzing leukemic cases according to date of birth and place of maternal residence. These studies are designed to elicit evidence relevant to a possible infectious basis for this type of leukemia.

Hormones and Neoplastic Cell Growth

This Scientific Section has been under the direction of Drs. Raymond Vande Wiele and Seymour Lieberman. The major thrust of the division is the elucidation of the relationships between humoral (hormonal) factors and selected neoplasms, particularly breast carcinoma and hematopoietic malignancies.

The laboratory of Dr. Andrew G. Frantz has continued its investigation of the factors regulating prolactin secretion and the effects of suppression of hormone secretion on the progress of disseminated carcinoma of the breast. Radioimmunoassay and immunohistochemistry are employed to evaluate prolactin production and tissue distribution. The effects of L-dopa on prolactin level and tumor symptoms are under study. Dr. William G. Dilley, with Dr. Sven J. Kister, has examined the growth properties

of normal and malignant breast tissue in organ cultures. A requirement for insulin and prolactin for cell growth *in vitro* has been established. Classification of breast tumors according to their pattern of hormone requirements *in vitro* is in progress.

The laboratories of Drs. Richard A. Rifkind and Paul A. Marks are investigating the nature of the cellular and molecular response of hemopoietic stem cells to hormonal regulators of differentiation. These studies indicate that erythropoietin exerts a primary effect on cell proliferation and may initiate differentiation along erythropoietic lines. Malignant erythroid cells (the Friend Leukemia Cell of mice) have lost this physiological regulation. The nature of this critical defect is under investigation.

Patient Care Development

Drs. Robert DeBellis and Bernard Schoenberg serve as Chief and Deputy Chief, respectively, of this Scientific Section, which is devoted to the study of the psychosocial aspects of neoplastic disease and to the development of improved modalities of medical care delivery to cancer patients and their families. Drs. Ivan Goldberg and Stephen Gullo have undertaken a study intended to identify wives of cancer patients who are at high risk to develop significant emotional and physical illness following the death of their cancer-stricken spouse. Preliminary studies have indicated that a serious threat to the health of relatives of certain cancer patients exists and that this may correlate with the emotional status of the family members. A study is in progress designed to establish predictive criteria for impending illness in this group and to develop prophylactic techniques to alleviate this epidemiologic problem.

Acknowledgments

The Cancer Research Center gratefully acknowledges support for its core facilities and for the work of its members from the National Institutes of Health, American Cancer Society, National Science Foundation, Atomic Energy Commission, Cooley's Anemia Foundation, American Heart Association, The Greenberg Foundation, American Lung Association, Hoffman-La Roche, Inc., Hirschl Foundation, R. G. K. Foundation, Rockefeller Foundation, National Foundation of Ileitis and Colitis, and Eye Cancer Foundation.

1973 Publications

Cancer Research Center

- Axel, R.; Gulati, S. C. and Spiegelman, S.
Particles containing RNA-instructed DNA polymerase and virus-related RNA in human breast cancers. *Proc. Nat. Acad. Sc.* **69**:3133-3137, 1972.
- Bank, A.; Dow, L. W.; Farace, M. G.; O'Donnell, J. V.; Ford, S. and Natta, C. L.
Change in globin synthesis with erythroid cell maturation in sickle-thalassemia. *Blood* **41**:353-357, 1973.
- Bauman, W. A.
Inpatient information system. *New York J. Med.* **73**:2248-2252, 1973.
- Baxt, W.; Hehlmann, R. and Spiegelman, S.
Human leukaemic cells contain reverse transcriptase associated with a high molecular weight virus-related RNA. *Nature* **240**:72-75, 1972.
- Baxt, W. G. and Spiegelman, S.
Nuclear DNA sequences present in human leukemic cells and absent in normal leukocytes. *Proc. Nat. Acad. Sc.* **69**:3737-3741, 1972.
- Baxt, W.; Yates, J. W.; Wallace, Jr., H. J.; Holland, J. F. and Spiegelman, S.
Leukemia-specific DNA sequences in leukocytes of the leukemic member of identical twins. *Proc. Nat. Acad. Sc.* **70**:2629-2632, 1973.
- Blobstein, S.; Grunberger, D.; Weinstein, I. B. and Nakanishi, K.
Isolation and structure determination of the fluorescent base from bovine liver phenylalanine transfer ribonucleic acid. *Biochemistry* **12**:188-192, 1973.
- Brisman, Ronald
Endocrine studies with empty sella. *J. Neurosurg.* **38**:537, 1973.
- Brisman, Ronald and Mendell, Gerald
Brain tumors and thromboembolic disease. *J. Neurosurg.* **38**:337-338, 1973.
- Brisman, Ronald; Schneider, Sanford and Carter, Sidney
Subarachnoid infusion and shunt function. *J. Neurosurg.* **38**:379-381, 1973.
- Cantor, C. R. and Weinstein, I. B.
Studies on rat liver phenylalanyl-tRNA synthetase. II. Further purification, substrate specificity and effects of substrates on heat inactivation. *J. Biol. Chem.* **249**:4052-4059, 1973.
- Curnen, M. G. McCrea
A search for Birth Clustering in Childhood Leukemia and an Attempt to correlate Influenza during Pregnancy with Leukemia in the Offspring. Columbia University, Doctoral Thesis (D.P.H.), February, 1973.
- Dow, L. W.; Terada, M.; Natta, C.; Metafora, S.; Grossbard, E.; Marks, P. A. and Bank, A.
Studies on thalassemia syndromes: Globin synthesis by intact cells and activity of isolated mRNA. *Nature* **243**:114-116, 1973.
- Duffy, Philip; Wolf, Abner; Harter, Donald H.; Gamboa, Eugenia T. and Hsu, Konrad C.
Murine influenza encephalomyelitis. II. Electron microscopic observations. *J. Neuropath. & Exper. Neurol.* **32**:72-91, 1973.
- Ellsworth, Robert M.
Tumors of the eye. In: *Cancer Medicine*, J. F. Holland and E. Frei, III, eds. Lea & Febiger, Philadelphia, 1973, pp. 1425-1436.
Tumors of the retina. In: *Retinal Diseases in Children*, W. Tasman, ed. Harper & Row, Hagerstown, Md., 1973, pp. 39-58.
- Farhangi, M. and Osserman, E. F.
Treatment of multiple myeloma. *Seminars Hemat.* **10**:149-161, 1973.
- Feldman, S. P.; Schlom, J. and Spiegelman, S.
Further evidence for oncornaviruses in human milk: The production of cores. *Proc. Nat. Acad. Sc.* **70**:1976-1980, 1973.
- Frantz, A. G.
Catecholamines and the control of prolactin secretion in humans. In: *Progress in Brain Research*, vol. 39. *Drug Effects on Neuroendocrine Regulation*. E. Zimmerman, W. H. Gispen, B. H. Marks, and D. DeWied, eds. Elsevier, Amsterdam, 1973, pp. 311-321.
The regulation of prolactin secretion in humans. In: *Frontiers in Neuroendocrinology 1973*. L. L. Martini and F. Ganong, eds. Oxford University Press, New York, 1973, pp. 337-374.
- Galloway, S.; Casarella, W. and Price, J. B., Jr.
Unilobar veno-occlusive disease of liver; angiographic demonstration intrahepatic competition simulating hepatoma. *Am. J. Roentgenol.* **119**:89, 1973.
- Grossbard, E. G.; Terada, M.; Dow, L. W. and Bank, A.
Decreased α mRNA activity associated with polyribosomes in α thalassemia. *Nature* **241**:209-211, 1973.
- Grunberger, D. and Weinstein, I. B.
Modification of proteins by 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea (NSC 79037) *in Vitro*. *Cancer Res.* **33**:1921-1924, 1973.
- Grunberger, George; Yu, F. L.; Grunberger, D. and Feigelson, P.
Mechanism of N-hydroxy-2-acetylaminofluorine inhibition of rat hepatic ribonucleic acid synthesis. *J. Biol. Chem.* **248**:6278-6281, 1973.
- Hall, E. J.; Rossi, H. H.; Kellerer, A. M.; Goodman, L. J. and Marino, S.
Radiobiological studies with monoenergetic neutrons. *Radiat. Res.* **54**:431-443, 1973.
- Hehlmann, R.; Baxt, W.; Kufe, D. and Spiegelman, S.
Molecular evidence for a viral etiology of human leukemias, lymphomas, and sarcomas. *Am. J. Clin. Path.* **60**:65-79, 1973.
- Kaye, G. Il.; Fenoglio, C.; Pascal, R. R. and Lane, N.
Comparative electron microscopic features of normal hyperplastic and adenomatous human colonic epithelium. *Gastroenterology* **64**:926-945, 1973.

- Kufe, D.; Hehlmann, R.; Peters, W. P. and Spiegelman, S.
Evidence for the involvement of RNA tumor viruses in human lymphomas including Burkitt's disease. In: *Lepetit Colloquium*. Cocoyoc, Mexico, 1973, pp. 153-167.
- Kufe, D.; Hehlmann, R. and Spiegelman, S.
RNA related to that of a murine leukemia virus in Burkitt's tumors and nasopharyngeal carcinomas. *Proc. Nat. Acad. Sc.* **70**:5-9, 1973.
- Kufe, D.; Magrath, I. T.; Ziegler, J. L. and Spiegelman, S.
Burkitt's tumors contain particles encapsulating RNA-instructed DNA polymerase and high molecular weight virus-related RNA. *Proc. Nat. Acad. Sc.* **70**:737-741, 1973.
- LoGerfo, P.
Immunology and colon cancer. *Dis. Colon Rectum* **16**:366-367, 1973.
- LoGerfo, P.; Herter, F. P. and Bennett, S.
Studies on tumor associated antigen. *J. Surg. Res.* **15**:290-295, 1973.
- Minio, Franco; Howe, Carl; Hsu, Konrad C. and Rifkind, Richard A.
Antigen density on differentiating erythroid cells. *Nature* **237**:187-188, 1972.
- Natta, C.; Banks, J.; Niazi, G.; Marks, P. A. and Bank, A.
Decreased beta globin messenger RNA activity in bone marrow cells in homozygous and heterozygous β thalassemia. *Nature* **244**:280-281, 1973.
- Nowinski, R. C.; Watson, K. F.; Yaniv, A. and Spiegelman, S.
Serological analysis of the DNA polymerase of avian oncornaviruses. II. Comparison of avian DNA polymerases. *J. Virol.* **10**:959-964, 1972.
- Pascal, R. R.; Koss, M. N. and Kassel, R. L.
Glomerulonephritis associated with immune complex deposits and viral particles in spontaneous murine leukemia. An electron microscopic study with immunofluorescence. *Lab. Invest.* **29**:159-165, 1973.
- Rifkind, R. A.; Cantor, L. N.; Cooper, M. C.; Singer, D.; Maniatis, G. M. and Marks, P. A.
Culture of normal and malignant erythropoietic precursor cells from fetal and adult mice. *Proc. Second International Workshop on Hemopoiesis in Culture*, Warrenton, Virginia, 1973.
- Rossi, H. H.; Hall, E. J. and Kellerer, A. M.
Biophysical factors in brachytherapy with low and high LET radiations. *Radiology* **107**:645-649, 1973.
- Schlom, J.; Colcher, D.; Spiegelman, S.; Gillespie, S. and Gillespie, D.
Quantitation of RNA tumor viruses and virus-like particles in human milk by hybridization to poly A sequences. *Science* **179**:696-698, 1973.
- Schmall, B.; Cheng, C. J.; Fujimura, S.; Gersten, N.; Grunberger, D. and Weinstein, I. B.
Modification of proteins by 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea (NSC 79037) *in vitro*. *Cancer Res.* **33**, 1973.
- Shah, N. and Wolff, J. A.
Thiamine deficiency: Probable Wernicke's encephalopathy successfully treated in a child with acute lymphocytic leukemia. *Pediatrics* **51**:750-751, 1973.
- Spiegelman, S.; Kufe, D.; Hehlmann, R. and Peters, W. P.
Evidence for RNA tumor viruses in human lymphomas including Burkitt's disease. *Cancer Res.* **33**:1515-1526, 1973.
- Spiegelman, S.; Marks, P. A. and Bank, A.
Decreased globin messenger RNA in thalassemia detected by molecular hybridization. *Proc. Nat. Acad. Sc.* **70**:1886-1890, 1973.
- Terada, M.; Cantor, L.; Rifkind, R. A.; Bank, A. and Marks, P. A.
Globin mRNA activity in erythroid precursor cells and the effect of erythropoietin. *Proc. Nat. Acad. Sc.* **69**:3535, 1972.
- Tscherne, J. S.; Lanks, K. W.; Salim, P. D.; Grunberger, D.; Cantor, C. R. and Weinstein, I. B.
Studies on rat liver phenylalanyl-tRNA synthetase. II. Further purification, substrate specificity and effects of substrates on heat inactivation. *J. Biol. Chem.* **248**:4052-4059, 1973.
- Vande Wiele, R. L. and Dyrenfurth, I.
Gonadotropin-steroid interrelationships. *Pharmacol. Rev.* **25**:189, 1973; also in: *New York Heart Association Symposium on Immunopharmacology*. M. deV. Cotten, ed. Williams & Wilkins Co., Baltimore, 1973, p. 189.
- Watson, K. F.; Nowinski, R. C.; Yaniv, A. and Spiegelman, S.
Serological analysis of the DNA polymerase of avian oncornaviruses. I. Preparation and characterization of monospecific antiserum with purified DNA polymerase. *J. Virol.* **10**:951-958, 1972.
- Weinstein, I. B.
Editor, *Cellular Targets of Carcinogens*, Interdisciplinary Communications Program, Smithsonian Institution, Washington, D. C., 1973.
- Weinstein, I. B.; Gebert, R.; Stadler, U. C.; Orenstein, J. M. and Axel, R.
Type C virus from cell cultures of chemically induced rat hepatomas. *Science* **178**:1098-1100, 1972.
- Zimmerman, E. A.; Hsu, K. C.; Robinson, A. G.; Carmel, P. W.; Frantz, A. G. and Tannenbaum, M.
Studies on neurophysin secreting neurons with immunoperoxidase techniques employing antibody to bovine neurophysin. I. Light microscopic findings in monkey and bovine tissues. *Endocrinology* **92**:931-940, 1973.

Dental and Oral Surgery

EDWARD V. ZEGARELLI

Dean of the Faculty of Dental and Oral Surgery • Director of Service

Newly appointed to the staff of the Department of Dental and Oral Surgery are: Adjunct Professor Matthew D. Levin; Assistant Clinical Professors Wayne A. Drysdale, John D. Piro, Barbara B. Rocco; Adjunct Assistant Professors William C. Baral, Godofredo V. Benedicto, Barney M. Croll, S. Robert Davidoff, Stanley P. Freeman, Steven I. Gold, Kenneth Jackier, Vincent E. Lynch, Harold Marantz, Michael Pleshette, Daniel W. Silfen, Paul J. Tannenbaum, Leonard B. Zaslow; Instructors Anthony J. Curinga, Gerald M. Drew, George Dubin, Robert A. Evedon, George L. Glick, Jeffrey Gold, Viktoria I. Kohler, John F. Kosinski, David M. Kritchman, Richard Lehrer, James A. Lipton, John C. Peterson, Roger P. Santise, Stephen Silston, John R. Varoscak, Nicholas A. Vero, Jr.; Assistants Richard F. Ceen, Michael F. Rudolph; Associate John Waldes; Research Associates Deborah F. Diserens, Judith Essig; Teaching Assistants Valerie C. Been, Nona I. Breeland, Carolyn F. Gray, Martha L. Liggett, Patricia A. Morgan, Kristen H. Talbott.

The following promotions were made: in Endodontics, Robert L. Ambinder, Philip J. Bauer, Harmon R. Katz and Lewis Zagon to Adjunct Assistant Professors; in Oral Surgery, Quentin M. Murphy to Instructor and Boaz M. Shattan and Morton J. Stern to Adjunct Associate Professors; in Pedodontics, Albert Green, Marvin B. King, Seymour Koster, Philip Kutner, and Julian Schroff to Adjunct Associate Professors and Arnold Rosenberg to Adjunct Professor; in Periodontics, Albert Salkind to Adjunct Associate Professor and Murray Schwartz to Clinical

Professor; in Preventive Dentistry, Robert S. Breakstone and Stephen V. Mender to Adjunct Assistant Professors and Howard Gordon to Instructor; in Prosthodontics, Jacob Abelson to Associate Clinical Professor, Gustav T. Durrer, Gerald M. Galvin and Joel Goldin to Adjunct Associate Professors and William J. Miller to Adjunct Professor; in Stomatology, John F. Capriccio to Adjunct Assistant Professor and Frances R. Karlan and Joseph Luban to Adjunct Associate Professors.

Edward V. Zegarelli, Robinson Professor of Stomatology, was appointed Acting Dean in September 1973.

The Dental School during the last year was re-accredited by the Council on Dental Education of the American Dental Association. The programs for Undergraduate Dental Education (D.D.S.), Undergraduate Dental Hygiene (B.S.), Graduate Dental Hygiene (M.S.), and Graduate (Specialty) programs were all reaccredited. The Dental Clinic continues to provide service to Vanderbilt Clinic patients as well as inpatients of Presbyterian Hospital. The new Hospital Dental Clinic in the Dental School provided for 1714 hospital patients. Patients were seen either for consultation or treatment, both on the wards and in our new facility. These services are in addition to the care provided a large clinic population in the clinics of the Dental School itself.

The Dental School regrets to report the deaths of former Deans Houghton Holliday and Bion R. East, Associate Dean Herbert Bartelstone, and Professors Julien W. Anderson and Milton Potters. Their dedi-

cation and contributions to the school will be long remembered.

Posts and Honors

Professional posts held and honors received by the various members were as follows: Dr. James W. Benfield, Chairman, Research Committee of the New York Academy of Dentistry; Dr. Frank E. Beube, Chairman, Periodontal Detection, American Association of Periodontics; Dr. Sebastian Bruno, President, American Academy of Maxillofacial Prosthetics; Treasurer, Greater New York Academy of Prosthodontics; Dr. Edward A. Cain, Tenured Faculty Senator to the Columbia University Senate; Ms. Michele Darby, Committee on Expanded Services, New York State Dental Hygiene Association and member of the Executive Board of Columbia Dental Hygiene Alumnae Association; Dr. Neal A. Demby, Secretary-Treasurer, Association of Neighborhood Health Centers Dental Directors: Region II; Dr. Anthony L. DiMango, Elected Fellow, American College of Dentistry and President, Second District Dental Society; Dr. Nicholas DiSalvo, President, Angle Society Eastern Component; President-Elect and member of the Executive Council, Northeastern Society of Orthodontists; Chairman, Executive Committee, Orthodontic Education Committee; American Association of Orthodontists; Delegate, Research Council; recipient of the Distinguished Service Award of the Orthodontic Alumni Society of Columbia University; Dr. Samuel F. Dworkin, President-Elect, Behavioral Science Dental Research Group of I.A.D.R.; Fellow (newly elected), American College of Dentists; Council, National Board of Dental Examiners; Dr. Daniel H. Fine, Chairman, Periodontology Section, American Association of Dental Schools; Dr. Marvin Firdman, Program Chairman, Ninth District Dental Society of New York State; Vice President, White Plains Dental Forum; Dr. Arnold M. Geiger, Member, Board of Directors, First District Dental Society; Chairman, Committee on Dental Education, First District Dental Society; Dr. Stephen Goodman, Member Advisory Board, New York State Dental Service Corporation; Director, Public Information, American Academy of Periodontology; Editorial Board, *Bulletin, Second District Dental Society*; Dr. Robert Gottsegen, Chairman, Committee on Education, American Academy of Periodontology; Dr. Edward Greenfield, Executive Committee, Tri State Society of Endodontics; Dr. Gary Gross, President of the Manhattan Academy of Dental Practice Administration; Dr. George Hindels, Fellow (newly elected), American College of Dentists; Dr. David Kaplan, Chair-

man, Advisory Committee, New York State Dental Assistant Association; Chairman, Advisory Committee, Dental Assisting Program, Rockland Community College; Chairman, Dental Assisting Committee, Rockland County Dental Society; Dr. Frances Karlan, President, Association of Dental Alumni, Columbia University; Dr. George C. Kiriakopoulos, Fellow, Royal Society of Health, London, England; Dr. Bert Klatskin, Fellow, American College of Dentists; Dr. Seymour Koster, Fellow, Academy of Dentistry for the Handicapped; Dr. Austin H. Kutscher, member, Board of Directors of Hospice, Inc., New Haven, Connecticut (Yale University School of Medicine); Attending Dental Surgeon (newly appointed), Psychiatric Institute, Department of Mental Hygiene, New York State; Editorial Consultant of the *Journal of the American Medical Association*; Conference Secretary for Symposia on Communications and Thanatology (newly elected); Dr. Joseph Leavitt, President, OKU, Columbia Chapter; President-Elect Century Club, School of Dental and Oral Surgery; Dr. Matthew D. Levin, President, Century Club Dental School, Columbia University; Dr. John J. Lucca, Attending Dentist (newly appointed), Presbyterian Hospital; Dr. George Lyons, Secretary, New York Academy of Dentistry; Ms. Donna E. McKinney, Chairman, American Dental Hygiene Association, Manpower Committee; Chairman, New York State Dental Hygiene Association Education Committee; Ms. Patricia McLean, Delegate, American Association of Dental Schools; Chairman, Expanded Functions Committee; Dr. Irwin D. Mandel, Henry Spenadel Award, First District Dental Society; Dr. Marvin Mansky, President, New York Chapter American Society for Preventive Dentistry; Dr. Frank L. Mellana, New York Academy of Dentistry; Dr. George A. Minervini, Member of the State Board for Dentistry (newly appointed by the Board of Regents of the State of New York); Dr. Bernard S. Moskow, President, Northeastern Society of Periodontists; Chairman, Committee on Research, American Academy of Periodontology; Dr. Irving Naidorf, Director, American Board of Endodontics; Member, American Board of Endodontics; Dr. Joseph Pianpiano, Chairman, Operative Section, First District Dental Society; Dr. Sydney C. Rappaport, President-Elect, Metropolitan Conference of Hospital Dental Services; Dr. Barbara B. Rocco, United Cerebral Palsy Fellowship; Dr. Solomon N. Rosenstein, Award, "In recognition of leadership in developing programs and methods of treatment in Dentistry for children and adults with Cerebral Palsy" from Dental Guidance Council for Cerebral Palsy; Dr. Fred Rothenberg, Vice President, Society

of Diplomates of New York Board of Oral Surgery; Dr. John M. Scarola, Active Fellow (newly elected), New York Academy of Dentistry; Dr. William H. Silverstein, Necrology Committee, American Academy of Gold Foil Operators; Dr. David A. Soricelli, Fellow, Philadelphia College of Physicians; President-Elect and Secretary-Treasurer, American Board of Dental Public Health; Dr. Edward Stroh, Chairman, Government Funded Programs, First District Dental Society; Dr. Ennio L. Uccellani, Chairman, Section of Prosthodontics, First District Dental Society; Assistant Secretary, Greater New York Academy of Prosthodontics; Dr. Robert F. Walsh, Chief of Dental Service (newly appointed), East Orange Veterans Administration Hospital; Dr. Ephraim Weinstein, Man of the Year Award, Yeshiva University Pre-Med Dental Society; Dr. David H. Wolmer, Election to OKU; Dr. Stephen Wotman, Traineeship, American College of Dentists, 11th Annual Symposium, 1973; Secretary, Dental School Finance Officers Section, American Association of Dental Schools; Coordinator, Student Program at Columbia Dental School of the New York State Dental Society; Dr. David J. Zegarelli, Fellow, American Academy of Oral Pathology; Dr. Edward V. Zegarelli, Advisory Committee on Grants of the American Dental Association (newly appointed).

Research

Drs. Edward V. Zegarelli, David J. Zegarelli, and Herbert Silvers began an extensive investigation regarding the diagnostic criteria and nature of lichen planus of the mouth, as well as an evaluation of the various therapeutic approaches currently used to control this disease. Their investigations are based on a group of almost 400 patients with oral lesions of this disease. Immunofluorescence studies are also being made in which Dr. Michael Z. Marder is participating.

Electron microscope studies are being conducted of the possibility of detecting evidences of viral activity in oral cavity papillomas. This work is being performed by Drs. E. V. Zegarelli, D. J. Zegarelli, and Elena C. Schmidt (Pathology).

Dr. D. J. Zegarelli recently initiated a study of the effects of antineoplastic agents on the dentition of the rat. With Dr. Joel Friedman of the Division of Prosthodontics as co-investigator he is also studying the histopathologic effects of various implant materials in the jaws of dogs. Dr. Marder is continuing his investigations on salivary electrolyte analysis in pathologic and nonpathologic states as well as immunofluorescent studies in certain oral diseases.

Drs. E. V. Zegarelli and Austin H. Kutscher are

continuing their investigations of the effects of topically applied corticosteroid formulations in the form of long-lasting lozenges on certain vesiculobullous ulcerative diseases of the mouth. Dr. Joseph Marbach is continuing his investigations on psychosocial and psychochemical aspects of temporomandibular joint disorders. Dr. Steven Gold is continuing his studies on psychosomatics in temporomandibular joint dysfunctions.

Drs. Arnold Geiger and Bernard Wasserman have been completing the statistical analysis of their long-term research on the relationship of occlusion and periodontal disease. The last two papers in this series of reports are now in press. Dr. Melvin L. Morris is continuing his studies on the biological properties of dentine and cementum and is investigating their effects on tissue cultures and oral bacteria. Dr. Bernard Moskow is studying the effect of heterotopic oral tissue transplants to the gingival sites. Dr. Herman Cantor began a clinical investigation on the comparative values of various methods of oral hygiene instruction. Dr. Robert Gottsegen is initiating a study on capillarity of the gingival margin. Dr. Gottsegen lectured before the Brazilian Society of Periodontology in Rio de Janeiro and the Venezuelan Society of Periodontology in Caracas. Dr. Burton Langer is continuing clinical research on distribution of the subgingival plaque. Dr. Albert Salkind, with Dr. Herbert Oshrain and others in the Division of Preventive Dentistry, is conducting additional studies of the bacterial plaque and its immunologic aspects.

Dr. Solomon Rosenstein expanded his evaluation of dental findings in a study of survivors of prematurity. Earlier findings demonstrated a significant correlation between dental and neurologic and psychometric abnormalities in these children. He also continued a long-range clinical study of tooth conservation in children. Dr. Seymour Koster continued to study the effect of neuromotor deficiency in the development of the dentition and its supporting structures in cerebral palsy patients with neuromotor deficiency of the head and neck. He also continued a study of changes in the oral structures in patients with scoliosis wearing the Milwaukee brace or body casts.

Members of the Division of Preventive Dentistry were engaged in a number of studies. Dr. Irwin Mandel investigated dental deposits, biochemical and bacteriologic aspects of composition and formation, salivary proteins, salivary and bacteriologic aspects of caries resistance, relation of salivary compositions to systemic disease, and the biochemical profile of salivary gland disease.

Dr. Stephen Wotman has been concerned with salivary composition in various forms of hypertension (with Dr. John Laragh [Medicine]); salivary changes in digitalis toxicity (with staff in Pharmacology); salivary changes during the menstrual cycle (with personnel in Obstetrics and Gynecology); and salivary changes in diabetes (with Drs. Marder and Jacob Abelson). Dr. Albert Zengo has been studying piezoelectric effects in bone (with C. Andrew L. Basset [Orthopedic Surgery]) and salivary and genetic factors in caries resistance. Drs. Ephraim Weinstein and Kenneth Siegel investigated the characterization of gingival fluid and quantitative changes in periodontal disease. Dr. Samuel Dworkin has been involved in investigating the cultural determinants of pain. Dr. Daniel Fine has been involved with the transport of saccharated iron oxide, horseradish peroxidase, and viellonella endotoxin across crevicular epithelium and the morphology of plaque formation.

Drs. Robert S. Goldman and Neal W. Chilton studied the effect of various agents on amount, composition, and pathogenic potential of dental plaque.

Drs. Abelson and Steven Katz are investigating salivary changes in diabetes, cirrhosis, and Sjögren's disease. Dr. Oshrain is studying the bacteriology of plaque and *materia alba*, and, with Dr. Stephen V. Mender, periodontal disease in patients taking immunosuppressants.

The following investigations are in progress in the Child Development Laboratory of the Division of Orofacial Development: facial and dental variability in Turner's syndrome and palatal, cranial, and facial skeletal morphology. Another study is that of cephalometric analysis of craniofacial variability in children with clefts of the lip and palate. Data derived from two groups of children with clefts are being compared with control samples of noncleft children of comparable age. Cephalometric measurements are being analyzed statistically using a computer program designed to test multiple variables. These studies are a joint project of the Division of Orofacial Development and the "Kinderchirurgisches" Department of the Children's Hospital, Bern, Switzerland. The co-investigators are Drs. Sidney L. Horowitz and Heli Vinkka (Columbia) and Drs. Marcel Bettex and Brigitte Graf-Pinthus (Bern). Cephalometric studies of mandibular morphology in children with juvenile rheumatoid arthritis are continuing with emphasis on the effects of the temporomandibular joints. Collaborating investigators are Drs. Horowitz, Marbach, Viktoria Kohler, and Dr. Jerome Rubin.

Dr. Abelson is conducting research on the effective

retention of various types of new cements for use in fixed partial prosthesis.

A clinical research project supervised by Dr. David Kaplan deals with the physical properties and characteristics of a material designed for patient use in dental emergencies. A comparative clinical study of the physical operating characteristics and relative effectiveness of two ultrasonic dental cleaning devices is also being conducted by Dr. Kaplan.

Drs. Edward Cain, Roy Boelstler, and Herbert D. Ayers (Prosthodontics) are continuing investigations of the sealing properties and hardness of powdered gold as a restorative dental material in the human dentition. Dr. Steven Scrivani is investigating new methods for clinically evaluating restorative procedures in Operative Dentistry. Dr. Frank Pandolfo is investigating methods of monitoring the management and care of patients by students in order to increase productivity and assure total care.

Research activities are progressing in the Division of Oral Surgery, with Drs. Harold Baumash and Louis Mandel continuing efforts to correlate x-ray studies, salivary chemistry, sialometry, and pathologic material in various salivary gland diseases. Drs. Mandel and George Minervini are involved in a clinical study whose purpose is to determine the efficacy of a cartilaginous paste in treatment of the painful dry socket.

Under the supervision of various members of the Orthodontic staff, the following studies were continued or completed: a study of physical characteristics in determining zygosity in twins; a pedigree study of prolonged retention of deciduous teeth and subsequent delay in eruption of permanent dentition; cephalometric appraisal of changes in the dentofacial complex resulting from various orthodontic techniques on anterior openbite; a study of changes in the volume potential of the palatal vault following tongue thrust correction therapy; examination of the effects of extraction therapy on facial height; determination of the morphological patterns and relationships of the mandible in patients with juvenile rheumatoid arthritis; retention study of extraction and nonextraction of orthodontically treated cases; incidence of malocclusion in wind instrument players; and cephalometric change occurring during Stage I of a standard Begg treatment. In addition, new studies include: a cephalometric study of prognathism; effect of non-extraction Begg treatment on lower incisors and evaluation of changes in position of Point A during the third stage of Begg light wire treatment.

With the Center for Community Health Systems, the Division of Community Health is in the process of developing a model dental group practice that

might determine the cost of scarce resources and their productivity, the productivity of resources when used in varying quantities and proportions, why productivities differ when resources are combined in these varying proportions and quantities, what forces operate to increase or decrease productivity, and how relative performances are influenced by customs, market structures, and laws.

Research programs currently in progress in the Psychiatric Institute Dental Service include those of Drs. Bernard Schoenberg (Psychiatry), Arthur C. Carr (Psychiatry), David Peretz (Psychiatry), and Ivan K. Goldberg (Psychiatry), with Dr. Kutscher in the study of: medical education in the areas of death and bereavement; drug therapy for the dying patient and the bereaved, including retrospective and prospective studies in patients with oral cancer and other terminal illnesses; associations between the presence of *Candida albicans* and clinically observable or subclinical infection with this organism as the result of therapy with Thorazine (as well as other established or experimental drugs); and continuing studies (particularly regarding course, control, or cure) of the "burning mouth" syndrome related to loss and grief, including group therapy approaches and the administration of psychopharmacologic agents. Drs. Ellen Hosiosky and Kutscher are studying the influence of anticipatory grief on periodontal disease. Dr. Arthur B. Weiss is completing a project testing the hypothesis that prepubescent patients are more cooperative orthodontic patients than older patients.

Investigations in the Endodontic Division involve a study of bacteriology and immunology of root canals and periapical areas and an investigation of the histologic response and healing potential of bone

to various materials and histologic evaluation of surgical endodontic procedures.

Ms. Marlene Klyvert of the Division of Dental Hygiene chaired a workshop on myofunctional Therapy sponsored by the Department of Health, Education, and Welfare.

Donors

The School of Dental and Oral Surgery expresses appreciation for contributions made in support of its program by many individuals and organizations, among them: Colgate-Palmolive Company, Mr. Curtis E. Calder, Miles Hodsdon Vernon Foundation, Inc., Shubert Foundation, Sergei S. Zlinkoff Fund, Warner-Lambert Company, Foundation of Thanatology, Block Drug Company, Clarence & Anne Dillon Dunwalke Trust, Dorothy M. Beskind, Dr. John Dalwin, Avon Foundation, Isadore & Pauline Hirschfield Foundation, Charles & Estelle Greenebaum Foundation, Lescarden, Ltd., American Fund for Dental Education, Dr. Neal W. Chilton, American Dental Association, Alumni, Class of 1947, Alfred W. Kleinbaum, Dr. Frank Celenza, United Cerebral Palsy of New York City, Inc., Harry & Roberta Salter Foundation, Barbara Hudnut Boston, Mr. F. G. Fusee, Dr. Morton L. Shapiro, Mrs. Sander Landfield, Mr. Adolph Hirsch, Ralph & Frances DeJur Foundation, Menley & James Laboratories, Mary & Milton Rosenback Foundation, Mr. and Mrs. Paul L. Davies, Mona Bronfman Sheckman Foundation, Mr. and Mrs. A. Snyder, Dr. Stanley R. Sadles, Dr. Alexander N. Lefschutz, Dr. Lawrence Paris, Dr. Alfred Rechter, Dr. Hanna J. Appel, Dr. Lawrence Marder, Dr. Paul T. Rasmussen, Dr. Edward J. Reynolds, Dr. John Richter, Estate of Clarence Mayer.

1973 Publications

Dental and Oral Surgery

Arvystas, M., et al.

Correction of maxillary protrusion with severe vertical dysplasia—A multidisciplinary approach. *J. Oral Surg.* 31:675-681, 1973.

Converse, J. M. and Horowitz, S. L.

Simianism: Surgical-orthodontic correction of bimaxillary protrusion. *J. Max. Fac. Surg.* 1:8-12, 1973.

Converse, J. M.; Horowitz, S. L.; Coccato, P. J. and Wood-Smith, D.

The corrective treatment of the skeletal asymmetry in hemifacial microsomia. *Plast. & Recon. Surg.* 52:221-231, 1973.

DiSalvo, N. A.

Evaluation of unerupted teeth: Orthodontic viewpoint. *Oral Health* 63:27-33, 1973.

Dworkin, S. F.

Psychodynamics of dental emergencies. *Dent. Clin. North America.* 17:3, 1973.

Geiger, A. M.; Wasserman, B. H. and Turgeon, L.

Relation of occlusion and periodontal disease. Part VI. Relation of overbite and periodontal destruction and gingival inflammation. *J. Periodont.* 44:150, 1973.

Goldberg, I. K.; Malitz, S. and Kutscher, A. H.

Editors, *Psychopharmacologic Agents for the Terminally Ill and the Bereaved*. Columbia University Press, New York, 1973.

- Hazen S.; Chilton, N. W. and Mumma, R. D.
The problem of root caries. *J. Am. Dent. A.* 86:137, 1973.
- Horowitz, S. L.
Panel discussion on the role of genetic and local environmental factors in normal and abnormal morphogenesis. *Acta. Morph. Neer. Scandinav.* 10:59-61, 1972.
Cleft lip and cleft palate: Research relevant to clinical management in dentistry. An NIDR state of the art report. Subcommittee on dentistry. *Am. J. Orthodont.* 63:517-523, 1973.
- Horowitz, S. L.; Weisbroth, S. H. and Scher, S.
Deciduous dentition in the rabbit (*Oryctolagus Cuniculus*). A roentgenographic study. *Arch. Oral Biol.* 18: 517-523, 1973.
- Klyvert, M.
Dental hygienists in community programs. *Dental Hyg.* 47, Sept.-Oct., 1973.
- Kutscher, A. H.
A continuum: Anticipatory grief, death and bereavement. In: *Death*. Wyschogrod, E., ed. Harper & Row, Hagerstown, Md., 1973.
- Kutscher, A. H. and Goldberg I. K.
Editors, *Oral Care of the Aging and Dying Patient*. Charles C. Thomas, Springfield, Ill., 1973.
- Kutscher, A. H. and Goldberg, Michael, R.
Editors, *Caring for the Dying Patient and His Family*. Health Sciences Publishing Corp., New York, 1973.
- Kutscher, A. H.; Schoenberg, B. and Carr, Arthur C.
Editors, *The Terminal Patient: Oral Care*. Columbia University Press, New York, 1973.
- Mandel, I. D.
Biochemical aspects of calculus formation. *J. Periodont. Res.* 10(Suppl.): 7, 1972.
- Mansky, M.
Plaque control for the dentist for the patient. *New York Dent.* 38:606, 1972.
- Marbach, J. L.
Therapy for mandibular dysfunction in adolescents and adults. *Am. J. Orthodont.* 62:601-605, 1972.
- Morris, M. L.
The subcutaneous implantation of periodontally diseased roots. *J. Periodont.* 43:737, 1972.
The subcutaneous implantation of red marrow with root without nick. *J. Periodont.* 44:96, 1973.
Sections on wound healing. In: *Orban's Periodontics*. Grant and Everett, eds. C. V. Mosby Co., St. Louis, Mo., 1972.
- Biological studies of the root and its connective tissue environment. *Israel J. Dent. Med.*
- Moskow, B. S.
Roentgeno-oddities: Unusually positioned mandibular molar. *Oral Surg. Med. Path.* 35:132, 1973.
Trichinosis in oral musculature. *J. Am. Dent.* 86:663, 1973.
- Moskow, B. S.; Crikelair, G. F. and Wheaton, E. A.
A case of severe oral infection associated with prolonged steroid therapy. *Oral Surg. Med. Path.* 34:590, 1972.
- Moskow, B. S.; Rennert, M. C. and Wasserman, B.
Interrelationships of dietary factors and heredity in calculus formation and periodontal lesions in the gerbil. *J. Periodont.* 44:81, 1973.
- Naidorf, I. J.
Inflammation and Infection of Pulp and Periapical Tissue: Biology of Human Dental Pulp. C. V. Mosby, St. Louis, Mo., 1973.
- Oshrain, H. I.; Salkind, A. and Mandel, I. D.
Bacteriologic studies of periodontal pockets ten minutes after curettage. *J. Periodont.* 43:11, 1972.
- Patterson, P. R.; Denning, C. R. and Kutscher, A. H.
Editors, *Psychosocial Aspects of Cystic Fibrosis*. Columbia University Press, New York, 1973.
- Shain, A.
The dental practitioner views his patients; Vignettes of the dying and the bereaved. In: *Oral Care of the Aging and Dying Patient*. Kutscher, A. H., and Goldberg, I. K., eds. Charles C. Thomas, 1973.
- Siegal, K. L.; Mandel, I. D. and Fine, D.
The measurement of gingival fluid. *J. Periodont.* 43:11, 1972.
- Solomon, C.
The mental foramen block: *Flatbush Dent. Soc. Bull.* January, 1973.
- Spriesterbach, D. C.; Dickson, D. R.; Fraser, F. C.; Horowitz, S. L.; McWilliams, B. J.; Paradise, J. L. and Randall, P.
Clinical research in cleft lip and cleft palate. The state of the art. *Cleft Palate J.* 10:113-164, 1973.
- Weiss, J.
Psychological factors in selecting dentistry as a career. In: *Oral Care of the Aging and Dying Patient*. Kutscher, A. H., and Goldberg, I. K., eds. Charles C. Thomas, Springfield, Ill., 1973.

Reports of Women's Auxiliaries

The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. CARLL TUCKER, JR., *President*

1973 was a year of challenges and frustrations but with Dr. Behrman's and Miss Cavanagh's energy and patience, Babies Hospital continued to move forward.

Our dreams of a new neonatal nursery were not realized nor was construction begun on the four new patient floors in the "Shell." I am skeptical about projecting completion dates but a March opening for the nursery seems realistic. Plans for the patient floors are out for bids and we hope construction will begin soon. One of the projects the four auxiliaries have aspired to this past winter was to start a gift shop for the Medical Center. Even though we were able to enlist volunteer expertise to launch this project, space was unavailable. This continues to be a problem throughout the Medical Center, but hopefully someday we will achieve a shop as we feel that one would be a convenience as well as a money raiser.

There were several additions to our physical plant in 1973. February saw the Neonatal Mobile Unit become operational. It has made many life saving trips since. In September the Transitional Care Nursery, adjacent to the delivery suite in Presbyterian Hospital, was opened. This permits high risk infants to be admitted for observation and stabilization before transfer to the appropriate nursery. This month the elevators in the new building go into operation and the new entrance opened. Temporary lobbies have been constructed on the unfinished floors. This, in fact, gives us a foothold in our new building as well as making renovation of elevators in the old building possible.

The Nursing Department has also had its challenges but somehow Mrs. Tilney and Miss McConville have kept the standards and morale high. The first crease came early in the year when the Trustees found it necessary to cut operational expenses throughout the hospital by 5%. This eliminated twelve nursing positions at Babies Hospital. This shortage, coupled with the overcrowded conditions caused by the closing of the fourth floor for the central laboratories, made conditions difficult. In December the nurses at the Medical Center voted to join the union. Despite all these difficulties we face 1974 with a far brighter picture. Eight of the twelve nursing positions have been reinstated and a part-time recreational therapist, funded by the Board, engaged. The additional therapist has made it possible to expand this program to bedridden children

while freeing nurses to care for the critically ill.

An irreplaceable loss to our nursing staff was Miss Priscilla Parke who retired in May. Miss Parke was instructor and supervisor in our Neonatal Nursery for twenty-five years.

The Pediatric Nurse Practitioner Program, funded from our Emergency Nursing Fund, was started in October. This program will not only teach our nurses to undertake even greater responsibilities but includes nurses from other hospitals. At the moment, Harlem and Roosevelt Hospitals are participating.

The Recreational Therapy Department continues to handle extraordinary numbers of children in inadequate space. Its continued success is due to the ingenuity and patience of Mrs. Collins and Miss Phillips. The space problem was alleviated somewhat during the summer months by moving some activities to the Hospital garden. Though an inconvenience to the staff, it proved a benefit to the patients and their parents. This department made 16,319 patient contacts and 2,530 schoolroom visits this year.

Other than the United Hospital Fund which netted us \$16,850.00 from gifts and \$535.00 from Box Week, the Thrift Shop and the theatre benefit are our chief sources of income. Under the dedicated leadership of Mrs. Trudso and her vice-chairman, Miss Kingsley, the Thrift Shop made over \$25,000.00 in 1973. It has been a constant struggle to get volunteer help and with the resignations of Mrs. Trudso and Miss Kingsley, who have worked tirelessly through the years, we decided it was time to reevaluate this endeavor. After due consideration, it was decided to give up our affiliation with Everybody's Thrift Shop and join the Bargain Box. We hope the uptown location will make volunteer help more plentiful. Mrs. Strickler has agreed to head the new Thrift Shop Committee.

The theatre benefit with Mrs. Walker and Mrs. Munn as co-chairmen netted us \$8,835.90. Mrs. Walker has agreed to head this committee for another year.

In 1973 we welcomed Mrs. William Rand, Mrs. Melvin Bedrick and Mrs. Adlai Hardin as members of the Board of Women Managers and accepted with regret the resignation of Mrs. Richard Migel. We also report with sorrow the deaths of Miss Ida Guerin and Mrs. John Reynolds; both members of the Board for 30 years.

Cribside Social Service Committee

MRS. WILLIAM E. HILL, *Chairman*

The Cribside Social Service Committee of the Board of Women Managers of the Babies Hospital has had a busy constructive year.

We continue to experience financial difficulties and have struggled on a stringent budget for the year 1973. One hundred fifteen children were sent to camp this year, focus was heavily on the handicapped. Twenty-four children were invited back to Camp Hidden Valley for the Thanksgiving weekend. This is an experience offered to children who are considered superior campers. We were pleased to have such a large number.

Endowed Beds were approved for fifteen needy children in 1973, which utilized our full quota of 270 days.

The Committee granted special education funds to the Social Service Department. This is used for case-oriented seminars extending over a 16-week period.

Our Thrift Shop, shared with a group of 11 other charities at Everybody's Thrift Shop at 330 East 59th St. has had its best year netting \$25,443.59. The expenses of carrying out this work have greatly increased. Our share in the shop expenses, including rent and maintenance, the amount for necessary paid workers, and the price of trucking large pieces have all become greater! We owe our phenomenal success to Mrs. K. Herluf Trudso who after 16 years as Chairman of our Thrift Shop is retiring for a long deserved life of her own. She has spent her

waking hours seeking out donations of salable wares, financial help toward rising costs and securing interested volunteers. The Board wishes to extend to Mrs. Trudso our deepest appreciation for her dedicated interest and service to the Babies Hospital.

The Board felt we could not continue at Everybody's Thrift Shop without Mrs. Trudso, so we have changed our affiliation to the Bargain Box at 1579 Third Avenue, where Mrs. Daniel Strickler, Jr. will head our new efforts.

At Christmas, Mrs. James McCosh Magie donated \$50.00 to be used for a needy family to make their Christmas brighter. This was supplemented considerably by an insurance company whose employees decided not to send greeting cards this year and donate the money to a "live cause." They wish to remain anonymous but their help was immeasurable.

Miss Esther Ridder has continued to be our special Social Service speaker annually. This year, she presented case material relative to an abortion case.

I am, as always, most grateful to our wonderful Cribside Committee for all their interest, encouragement and support. I also wish to thank our Social Service Staff at Babies Hospital and, in particular, Miss Agnes D. Dilworth, the Associate Director, for their contribution to the social needs of the children coming to their attention, both in the Pediatric Clinics and in the Hospital. Their social work expertise is invaluable in terms of the serious social pathology inherent in today's living.

Women's Auxiliary of the Neurological Institute

MRS. JOHN L. WEINBERG, *Chairman*

The major concerns of the Neurological Institute have continued to be focused around the humanitarian needs of the hospital patient in an era where powerful forces are changing the whole spectrum of medical care throughout the United States—both the institutions and the ways in which medical care is delivered.

One of the primary interests of the Neurological Institute Auxiliary has been and continues to be the Social Service Department. Half of funds raised from ongoing fund raising functions goes to Social Service salaries. This is 80 per cent of the money allocated to the Social Service Department by the Auxiliary. It seems time, I believe, to reconsider the underlying assumptions in this proportionment of money spent. Should our goal be the funding of salaries of established departments or should it be to initiate and fund projects, in answer to expressed needs by the administration, which increase the effectiveness of operating departments.

Special programs such as research and staff development, innovative procedures which improve patient care and planning, and facilities non essential in character but advantageous to the well-being of the patient are areas in which the Auxiliary can be extremely effective; and, therefore, derive most satisfaction and motivation for future efforts.

Although a small Auxiliary cannot generate large funds itself, through thoughtful solicitation it can serve as an ancillary arm to attract and channel funds from other interested groups. The camp program of the Social Service Department for 15 children and two adults with seizure problems is a good example. Camp expenses were \$8,192.25. Of this \$6,000 came from "Big E for Epilepsy"; \$340 through Mrs. Charles Adams as Almoner for the Haven Relief Fund Society; \$500 from the Society for the Relief of Women and Children.

Urgent needs of patients for which government funds are not available are transportation, home-maker services, medical appliances and their maintenance, and clothing. The Auxiliary appropriated \$3,387 to the Social Service Department to provide for these. \$460 came through the Haven Relief Fund Society. Through the efforts of Mrs. Frank T. Weston, an Auxiliary member, new improvements in

recording work flow and systems of accountability were facilitated.

In helping patients and their families come to grips with the changes that their illness imposes on them, the social work staff must spend a great deal of time on discharge planning. An inordinate amount of time and money spent is directly chargeable to inadequacies of the home care service system needed to maintain disabled and chronically ill patients in their own homes and communities and to the procedures through which such services are made available.

As part of a continuing educational process to make themselves more effective, the Social Service staff participated in a study of the home care planning needs of the elderly in Washington Heights undertaken by the School of Public Health in co-operation with the Washington Heights Ad Hoc Committee for Home Health Planning. This was supported by the Borch Memorial Fund. At the December meeting and luncheon the social work staff presented an interesting program illustrating how careful planning enabled severely handicapped neurological patients to remain at home in their community.

As a further step of inquiry into better methods of support and preventative care for the patient with chronic disease, often diseases of the elderly, the Auxiliary with the special interest of Mrs. Edith Achilles helped support the three day visit to the Medical Center of Dr. Lionel Z. Cosin, Clinical Director, Department of Geriatric Medicine and of the Cowley Road Hospital, United Oxford Hospitals, Oxford, England. Dr. Cosin gave valuable insights into different approaches to chronic illness not generally in practice in this country, especially in relation to day hospital treatment for the geriatric patient, new ways of using hospital space, and many ideas on planning for maintenance of the elderly in the community.

Under the foresighted and thoughtful direction of Miss Jean Collard, the Social Service Department undertook its first federally funded research grant project, a study of the relationships between the illness of the patient and his social, environmental and emotional stresses. Entitled "Total Care Planning for

the Brain Tumor Patient," this study enlisted the services of Dr. Ben Orcutt, Professor of Social Work at the Columbia University School of Social Work as chief researcher as well as a full-time doctoral candidate in social work along with the collaboration of the staff. Although the initial funding was not reinstituted after August 1973 the Neurological Institute Auxiliary made it possible to complete the first phase of this work.

Two important areas of interest in Neurological Institute in which the Auxiliary takes pride are the nurse specialist in the clinic, a trouble shooter and a team coordinator between doctors, patients and families and the activities of a play therapist for the children on Wednesday afternoon in the Neurology Clinic. After many abortive efforts to staff the playroom with reliable volunteer help, Mrs. Richard Masland, Chairman of the Clinic Committee, suggested that we appropriate funds for a paid worker. We congratulate Miss Sylvia Netzer for the excellent job she is doing with these children.

Hospital activities enthusiastically supported are the Milbank Library to which the Auxiliary appropriated \$7,234 and the Volunteer Service to which it gave \$1,900. We thank Mrs. John Hoyt Stookey for assuming Chairmanship of this Activities Committee.

Annual financial support for Auxiliary projects came from two sources: the Thrift Shop and the United Hospital Fund. Although Mrs. Charles Adams who has done such a magnificent job for many years as Chairman of the United Hospital Fund Committee retired this year, we were fortunate to have as our new Chairman, Mrs. Gavin MacBain who has done an outstanding job. In spite of a shrinking committee, there were 173 gifts totaling \$28,051 and \$180 was raised from Box Week. \$19,441 of this money goes directly to the care of Clinic and Ward patients. We are grateful to Mrs. Royall Cannaday for her dedication as Chairman of the Thrift Shop Committee over the years. Through the efforts of these persevering volunteers, Mrs. Charles Stroud, Mrs. H. Houston Merritt, Mrs. Niels Low, and Mrs. R. H. George, the Thrift Shop reported sales totaling \$19,959 and distribution of \$14,060. Mrs. Edward B. Schlesinger has been exploring ideas for a benefit. A former chairman, Mrs. Schlesinger has been especially helpful on so many Auxiliary projects.

Attrition in the membership of the Auxiliary is a worrying trend. We accepted with great regret the resignation of Mrs. Donald David, an invaluable member of our board for many years and the change

of membership from active to associate of Mrs. H. McLeod Riggins. On a more positive note, we feel very honored to welcome as a new member, Mrs. Lewis Rowland.

We joined with other Auxiliaries to explore our similar problems—definition of goals, membership, and fund-raising. Mrs. Carl Chadsey, Mrs. Frank T. Weston, Mrs. Richard Masland, Mrs. Neils Low and Mrs. John L. Weinberg of the Neurological Auxiliary attended the United Hospital Fund Auxiliary Conference, "Spotlight on your Hospital Auxiliary. Does it make a Difference." Mrs. Weinberg became a member of the United Hospital Fund Executive Committee and Mrs. Richard Masland of the United Hospital Fund Auxiliary Committee. In addition, Mrs. George Spater and several other members of the Auxiliary had a series of exploratory meetings concerning a hospital gift or service shop. After conferring with administrative personnel, it was decided that at this moment the project was not a feasible one because of lack of space.

Communication between the Auxiliaries and the administration and among the Auxiliaries themselves is enhanced by the luncheon for the Auxiliaries that Mr. Alvin Binkert gives each month. We appreciate the time and valuable guidance given by Mr. Binkert, Dr. Carl R. Wise, and Dr. Milton Porter. Through them we gain a glimpse of the multiplicity of interacting forces fiscal, political and social as well as medical which influence the survival of a large teaching and research medical center.

This year we were fortunate to have several outstanding speakers at our meetings. At the April meeting, Dr. Edgar M. Housepian, introduced by Dr. Masland as a man who projects into the future, described the applications of television and audio-visual aids as teaching instruments and told of their development and use in Neurological Institute. At lunch that day Dr. Mary I. Crawford, Chairman of the Department of Nursing spoke about new developments in nursing. At the September meeting, Dr. Ben Orcutt reported on the objectives and progress in her study on the psycho-social effects of catastrophic illness on patients and their families. We were privileged in October to hear Dr. Lewis Rowland speak on the history, strengths, and problems at Neurological Institute, and in November Dr. Rowland introduced Dr. Stanley Fahn, Head of Clinical and Laboratory Research on Parkinson's Disease and other related disorders, who gave a fascinating talk on the present research program, key to an understanding of degenerative diseases ap- its interdisciplinary team and his future plans. The

pears to lie in a knowledge of the chemicals which serve as transmitter agents, the specific brain cells which contain them and the pathways for the known transmitters in the nervous system. Present research in mapping the chemical pathways of the nervous system will add to our understanding of normal brain functioning as well as the neurological diseases.

On July 1, 1973, Dr. Richard Masland retired as Director of Service of Neurological Institute. Working under him has been an inspiring experience. His illuminating understanding and broad perspective informed many of our decisions over the past four and a half years and we are happy that he is remaining here as H. Houston Merritt Professor of Neurology. We welcome Dr. Lewis Rowland as the new Director. Miss Martha E. Haber, Director of Nursing, was succeeded by Miss Madeline DeTalvo.

I want to thank all of those at the Institute who have so generously given their time and support to the Auxiliary: Dr. Masland, Dr. Rowland, Miss Collard and Miss Barbara Farace, our Unit Manager. It has been a rewarding experience to have had the counsel of so many outstanding people. I am grateful also to each member of the Auxiliary for their strong participation and heartwarming support.

As my five years as Chairman comes to an end, it seems most appropriate to highlight certain questions and concepts which have become increasingly important during my time at Neurological Institute.

1. To what extent should an Auxiliary commit its annual budget to the funding of salaries in

branches of the hospital field such as Social Service which are now an integral and inseparable part of advanced hospital science?

2. Is there a need for an auxiliary which with small amount of money serves as a catalyst and through research and innovative programs initiates needed changes or helps provide ancillary services that the hospital would not consider part of its operating procedure? Is this a viable service or a burden to the administration?
3. Confusion about functions and goals of a hospital auxiliary is widespread and compounds persistent problems of membership. Today more women who are not totally engaged in bringing up young children are either moving into career activities or are stimulated by interests other than community service activities. Competition for the fewer competent, reliable volunteers is intense. Fund raising and public relations for the hospital are vital and traditional functions of the Auxiliary. The commitment of volunteers to these traditional activities and their number can be greatly enhanced if the overall program includes not only these traditional activities but also is enriched by new and flexible programs.

Since the above poses the problem of attracting and motivating high caliber volunteers, it affects not only the Auxiliary itself but also the hospital and the administration. I believe a cooperative study of these areas should be undertaken in the near future.

Women's Auxiliary of the New York Orthopaedic Hospital

MRS. ROBERT E. CARROLL, *President*

As I finish my first year as President of the Auxiliary, I would like to thank Mrs. George Johnston, Jr., who has served as our outstanding President for the past two years. Her continued guidance and counsel have been most helpful throughout the year.

I wish to express the appreciation of the Board to Mrs. Donald Wallace for her excellent work as Treasurer from 1967 to 1973. Mrs. Walter Mann has taken over the job of Treasurer. I would also like to thank Mrs. Hugo Keim for her continued help as our most efficient Secretary.

This past year we welcomed Mrs. John Stevenson back as an active member of our Board.

The United Hospital Fund drive was again under the competent leadership of Mrs. Edward Gerry. As of December 31, 1973, the Auxiliary has raised \$22,636 and our direct benefit quota is \$11,910.

With the exception of the May meeting at the United Hospital Fund Headquarters our monthly meetings have been held at the Hospital. We have had interesting reports from Miss Rosemary Hoynak, Director of Orthopaedic Nursing. Her tireless efforts and dedication have resulted in superb care for the patients.

Mrs. Eva Hoffman and Mrs. Lisa Jantzen, our two recreational therapists, have also been guests at our meetings. Mrs. Hoffman continues her outstanding work with children while Mrs. Jantzen has contributed immeasurably to the comfort and interests of the adult patients.

During the year we have had members of the Orthopaedic staff speak to us on different aspects of

orthopaedic surgery. Dr. David L. Andrews described the mechanism of emergency care to the injured patient in accidents. Dr. Andrew Bassett took us on an informative tour of the Orthopaedic Research Laboratory. Dr. Robert E. Carroll gave an illustrated lecture on recent advances in surgery of the hand for children with congenital deformities.

To give a more interesting and brightened appearance to Babies 5, the Auxiliary has provided decorative shades and bulletin boards for the rooms. At our suggestion an intercom system has been installed to supervise constant communication between the nurses and patients. A new isolation unit was established for the floor.

As in the past, members of the Auxiliary contributed Christmas stockings, games and decorations for the children in the hospital. Books, toys and materials for the recreational therapists were donated when needed throughout the year.

The budget for the year included support for the care of ward and clinic patients, salary for a recreational therapist, recreational therapy supplies, partial salary for an assistant librarian in the Milbank Library and contributions for running the department. The total expenditures of the Auxiliary for 1973 were \$34,089.52 which included \$19,136.00 for ward and clinic patients.

I want to thank the entire Auxiliary for their participation and support in many different ways throughout the year. It is with interest and pride that we have continued the support given to the New York Orthopaedic Hospital by the Women's Auxiliary.

Women's Auxiliary of the Presbyterian Hospital

MRS. FRANCIS H. CABOT, JR., *Chairman*

In 1973 the Auxiliary has had 65 active members, 40 associate members, and 7 junior members. We welcomed as new active members Mrs. E. Foster Conklin, and Mrs. Robin B. Rankow. Mrs. C. Dary Dunham, Mrs. Richard J. Stock, and Mrs. Jose M. Ferrer have all transferred from active to associate membership. We wish to thank Mrs. Ferrer particularly for her unflagging help over the years. Mrs. Keith Reemtsma resigned. It is with great sorrow that we record the death of Mrs. Walton P. Kingsley, a leading supporter of the Thrift Shop. She is sorely missed.

The United Hospital Fund Committee is headed by Mrs. John B. Price, Jr. Six team captains with 36 letter writers had successfully raised \$37,651.72 by the end of December. This is \$20,622.72 over the direct benefit quota. The drive officially ends on February 28th. Mrs. Carl Truman Nelson is chairman of hospital teams for the United Hospital Fund of New York.

The Stuyvesant Square Thrift Shop has brought in \$24,960. Mrs. Equinn W. Munnell is the able, hard-working chairman of this committee. She is aided by two vice-chairmen, Mrs. Malcolm H. McAllister and Mrs. George W. Melcher and a group of devoted workers. Mrs. Ralph H. Boots took over handling the receipts after the death of Mrs. Kingsley. Some of the house staff wives have helped tremendously, but the shop is always in need of workers. It has been requested that every active member of the Auxiliary come at least four times during the year. Mrs. Richard Weil, III, head of the Benefit Committee, is planning a fashion show lunch to be held at the Pierre Hotel with Lord & Taylor as sponsors. Last year's show by Kaspar, chaired by Mrs. Cornelius J. Tyson, Jr., netted \$1,097 as well as bringing in thrift to the Thrift Shop. (\$25.00 worth of thrift must be donated by all subscribers to the luncheon.) \$350.00 was contributed to the Thrift Shop in memory of Mrs. Kingsley.

Mrs. David L. Andrews as chairman of the Nursing Committee reports that the Fifteenth Annual Card Party and Raffle Event for the benefit of the Nursing Scholarship Fund was held on Thursday, April 12th. The amount this year equaled last year's \$17,000. Included in this income were two major

gifts as well as \$500 contributed by the Auxiliary.

The Milbank Library continues to serve over 14,000 patients and 3,000 staff. The Library Committee, led by Mrs. John VanB. Dean, has the help of 20 volunteers who take book carts to all patient floors of Presbyterian and Orthopaedic Hospitals as well as Harkness Pavilion, Neurological Institute, and the Eye Institute where Mrs. Dean runs the Talking Book program. There has been a noticeable increase of young patients from Babies Hospital using the Library for school assignments as well as many staff members who are either continuing their education or are becoming United States citizens.

Mrs. Hilary Holmes, chairman of the Recreational Therapy Committee reports that Mrs. Pat Barlosky is the new head of the department. An entertainment program, using the piano which the Auxiliary contributed, has been started.

The Social Service Department, our committee chaired by Mrs. A. Gerard DeVoe, was aided by the Anna Ball Kneeland Fund for a course on innovative methods in social work. Additional funds were voted for a course on "Violence in the Family." Through Mrs. Samuel W. Lambert, Jr. and Mrs. Ralph H. Boots, almoners for the Haven Relief Fund Society, \$2,100 was received in meeting special patient care.

The Volunteer Department continues to function well in its new quarters in the Vanderbilt Clinic basement. The number of volunteers has decreased slightly, probably due to people moving out of the Hospital neighborhood. Our chairman, Mrs. George A. Perera, and vice-chairman, Mrs. Frode Jensen were pleased with the Awards Tea held in April. Mrs. Joy Silverman and the Student Nurses Glee Club provided entertainment. In 1973 a total of 736 volunteers worked 102,645 hours. In November the Hospital was threatened by a Union strike. Every member of the Auxiliary that could help was willing to do so. Mrs. Dorothy Diamond, head of the Volunteer Department, had passes issued and everything was organized. Fortunately the strike never took place, but the response was heartening.

A joint committee of the heads of the four Women's Auxiliaries of the Columbia-Presbyterian Medical Center was formed in order to try to re-

establish a gift shop in the Hospital. We met with some members of the administrative staff of the hospital. They were willing to give us the existing space of the old gift shop, but could not give hope of any more space. Unfortunately our committee felt that this would be impossible, so the project has been postponed.

During the course of the year we were pleased to have several speakers at our monthly meetings. Dr. John H. Bryant spoke on "The Role of the Community Health Center," Dr. Walter Kessler gave a talk entitled "Are Allergies Emotional," Miss Elisabeth Graham of the Social Service Department dis-

cussed "Adolescent Problems," and Dr. Joseph A. Silverman addressed us on "Anorexia Nervosa." All these talks were extremely interesting and we are very grateful to the speakers for giving us their time.

In closing I would like to thank especially all the committee chairmen, everyone of whom is willing and cheerful; Mrs. George A. Carden, who left everything in perfect order; and the other officers of the Auxiliary, all of whom have been extremely helpful. I also want to thank the Hospital secretarial staff for their good work and Mr. A. J. Binkert and the Administrative Staff for their valuable time and energy spent in keeping us informed.

Trustees and Committees

The Presbyterian Hospital in the City of New York
and Columbia University in the City of New York

Trustees of Columbia University in the City of New York

The names of the Trustees are listed according to length of service. The names of the Alumni Trustees are followed by the inclusive dates of their terms of office; the names of the Term Trustees are followed by their terminal dates.

William A. M. Burden
Partner
William A. M. Burden & Co.

William T. Gossett
Member of
Dykema, Wheat, Spencer
Goodnow & Trigg

Samuel R. Walker
Real Estate Consultant

Harold F. McGuire *Vice Chairman*
Senior Partner
Wickes, Riddell, Bloomer,
Jacobi & McGuire

Frederick vanPelt Bryan
U. S. District Judge

Frank S. Hogan *Vice Chairman*
District Attorney
New York County

Harold A. Rousselot *Clerk*
Executive Vice President
duPont, Walston, Inc.

William E. Petersen
Chairman

Arthur O. Sulzberger
President and Publisher
The New York Times

Arthur B. Krim
(1979)
Chairman
United Artists Corporation

Charles F. Luce
Chairman and Chief Executive Officer
Consolidated Edison Company
of New York, Inc.

Lawrence E. Walsh
(1974)
Partner
Davis Polk & Wardwell

Robert D. Lilley
(1968-1974)
President
American Telephone &
Telegraph Company

M. Moran Weston
(1975)
Rector
St. Philip's Episcopal Church

W. Clarke Wescoe
(1975)
Vice Chairman
Sterling Drug, Inc.

Franklin A. Thomas
(1975)
President
Bedford Stuyvesant Restoration Corp.

Daniel F. Crowley
(1969-1975)
Executive Vice President for
Finance and Administration
McGraw-Hill, Inc.

William J. McGill
President of the University

Thomas M. Macioce
(1970-1976)
President
Allied Stores Corporation

Carl W. Desch
(1971-1977)
Senior Vice President
and Cashier
First National City Bank

Charles M. Metzner
(1972-1978)
U. S. District Judge

Walsh McDermott
(1973-1979)
Livingston Sarrand Professor of
Public Health
Cornell University

Trustees Emeriti

Adrian M. Massie
Member of the Trust Committee
Chemical Bank

Douglas M. Black

William S. Paley
Chairman of the Board
Columbia Broadcasting System, Inc.

Grayson Kirk
President Emeritus of the University

Lester D. Egbert

Maurice T. Moore
Partner
Cravath, Swaine & Moore

Robert W. Watt

Walter H. Sammis
Director
Ohio Edison Co.

Alan H. Temple
Retired Vice Chairman
First National City Bank of New York

Benjamin J. Bottenwieser *Associate Ch*
Limited Partner
Kuhn, Loeb & Company

Andrew W. Cordier
President Emeritus of the University

Joint Administrative Board

The Presbyterian Hospital in the City of New York
and

Columbia University in the City of New York

Hospital Trustees

A. J. Binkert
Roger M. Blough
Thomas H. Choate
Fredrick M. Eaton

Frederick R. Kappel
Augustus C. Long
Frederick A. O. Schwarz
Robert Winthrop

University Trustees

William J. McGill
Frederick van Pelt Bryan
Daniel F. Crowley
Carl W. Desch

Robert D. Lilley
Walsh McDermott, M.D.
William E. Peterson
W. Clark Wescoe, M.D.

Trustees of the Columbia-Presbyterian Medical Center Fund, Inc.

William J. McGill, *Chairman*
Mrs. Katharine L. Auchincloss
Nicholas F. Brady
Thomas H. Choate, *Vice-Chairman*
Daniel F. Crowley, *Treasurer*
Carl W. Desch
Fredrick M. Eaton
Harold H. Helm

Frederick R. Kappel
Robert D. Lilley
Augustus C. Long
Walsh McDermott, M.D.
William E. Peterson
Frederick A. O. Schwarz
Cyrus R. Vance
W. Clark Wescoe, M.D.

Trustees and Officers of The Presbyterian Hospital in the City of New York

AUGUSTUS C. LONG, *Chairman Emeritus*
Chairman of the Executive Committee, Texaco Inc.

CLEO F. CRAIG, *President Emeritus*

FREDRICK M. EATON, *Chairman of the Board*
Partner, Shearman & Sterling

THOMAS H. CHOATE, *Co-Chairman of the Board*

*JOHN H. LARAGH, M.D., *Vice Chairman of the Board*
Attending Physician, *The Presbyterian Hospital in the City of New York*

*A. J. BINKERT, *President*

ROGER M. BLOUGH, *Vice President*
Partner, White & Case

HAROLD H. HELM, *Vice President*
Chairman, Directors' Advisory Committee,
Chemical Bank

FREDERICK R. KAPPEL, *Vice President*
Retired Chairman of the Board,
American Telephone and Telegraph Co.

FREDERICK A. O. SCHWARZ, *Vice President*
Partner, Davis Polk & Wardwell

JOSEPH A. THOMAS, *Vice President*
Senior Managing Director,
Lehman Brothers Incorporated

CYRUS R. VANCE, *Secretary*
Partner,
Simpson Thacher & Bartlett

JAMES W. WALKER, *Assistant Secretary*
Investment Management

THATCHER M. BROWN, JR., *Treasurer*
Vice Chairman of the Board
and Director
G. H. Walker, Laird Incorporated

JAMES W. FOLEY, *Assistant Treasurer*
Retired Vice Chairman, Texaco Inc.

TRUSTEES

Hulbert S. Aldrich
Chairman,
Hill Samuel Inc.

Malcolm P. Aldrich
Honorary Chairman of the Board,
The Commonwealth Fund

Edward H. Auchincloss
President,
Auchincloss & Lawrence Incorporated

Robert H. B. Baldwin
President,
Morgan Stanley & Co., Incorporated

Nicholas F. Brady
Chairman,
Dillon, Read & Co. Inc.

Mrs. B. Rionda Braga

John W. Brooks
Chairman and Chief Executive Officer,
Celanese Corporation

Carter L. Burgess
Chairman of the Board,
Flagship International, Inc.

James M. Clark
Chairman of the Finance Committee,
Hornblower & Weeks-Hemphill,
Noyes Incorporated

*George F. Crikelair, M.D.
Attending Surgeon,
The Presbyterian Hospital in the
City of New York

*Arthur Gerard DeVoe, M.D.
Director, Ophthalmology Service,
The Presbyterian Hospital in the
City of New York

George S. Dillon
Chairman of the Board,
Airco, Inc.

Henry W. Gadsden
Chairman of the Board & President,
Merck & Co., Inc.

Mrs. Edward H. Gerry

John A. Gifford
Counsel,
White & Case

Maurice F. Granville
Chairman of the Board,
Texaco Inc.

W. E. S. Griswold, Jr.

Ralph F. Leach
*Chairman of the Executive
Committee and Director*
Morgan Guaranty Trust Company
of New York

Mrs. Robert James Lewis

Alfred L. Loomis, Jr.
St. Vincents Island Company

*Paul A. Marks, M.D.
Vice President for Health Sciences of
Columbia University

*ex officio (without vote)

TRUSTEES (Cont.)

- Birny Mason, Jr.
Chairman, Executive Committee,
Union Carbide Corporation
- Thomas P. F. Milbank
Corporate Executive
- Milton C. Mumford
Director and Retired Chairman,
Lever Brothers Company
- *Charles A. Ragan, Jr., M.D.
Director, Medical Service,
The Presbyterian Hospital in the
City of New York
- *William B. Seaman, M.D.
Director, Radiology Service,
The Presbyterian Hospital in the
City of New York
- Dorrance Sexton
Retired Chairman of the Board,
Johnson and Higgins
- *Joseph A. Silverman, M.D.
Assistant Attending Pediatrician,
The Presbyterian Hospital in the
City of New York
- *Frank E. Stinchfield, M.D.
President, Medical Board,
The Presbyterian Hospital in the
City of New York
- Charles H. Symington, Jr.
Executive Vice President and Treasurer,
G. H. Walker, Laird Incorporated
- Mrs. Carll Tucker, Jr.
- Sidney J. Weinberg, Jr.
Partner,
Goldman Sachs & Co.
- Robert Winthrop
Honorary Chairman,
Wood, Struthers & Winthrop, Inc.

*ex officio (without vote)

HONORARY TRUSTEES

- August Belmont
Retired Chairman,
Dillon, Read & Co. Inc.
- Edward C. Bench
- John E. Bierwirth
Chairman of the Board,
National Distillers and
Chemical Corporation
- Lucius D. Clay
- W. Sheffield Cowles
- Cleo F. Craig
President Emeritus
- Mrs. Frederic F. deRham
- Frederic G. Donner
Chairman of the Board,
Alfred P. Sloan Foundation
- Thomas C. Fogarty
Retired Chairman of the Board,
Continental Can Company, Inc.
- John M. Franklin
Retired Chairman of the Board,
United States Lines Company
- Artemus L. Gates
- George Lauder Greenway
Honorary Chairman, Metropolitan
Opera Association
- Peter Grimm
Chairman of the Board,
William A. White & Sons
- Perry E. Hall
Limited Partner,
Morgan Stanley & Co., Incorporated
- Charles Barney Harding
Member of the Advisory Board,
Smith Barney & Co. Incorporated
- Samuel W. Meek
Publisher
- Rev. John O. Mellin, D.D.
Minister, First Presbyterian
Church
- Charles S. Munson
Honorary Chairman,
Airco, Inc.
- Robert D. Murphy
Honorary Chairman of the Board,
Corning International Corporation
- Charles S. Payson
Retired
- Rev. Norman Vincent Peale, D.D.
Senior Minister, Collegiate
Church of New York
- Rev. James Gray Spence
Minister, Second Presbyterian
Church
- John P. Stevens, Jr.
Retired Chairman of the Board,
J. P. Stevens & Co., Inc.
- Benjamin Strong
- Frederick Sturges, Jr.
- Mrs. Henry C. Taylor
- Kenneth C. Towe
- Mrs. Sheldon Whitehouse

COMMITTEES OF THE BOARD OF TRUSTEES

EXECUTIVE

Fredrick M. Eaton, *Chairman*

Hulbert S. Aldrich

*A. J. Binkert

Roger M. Blough

Thatcher M. Brown, Jr.

James M. Clark

James W. Foley

John A. Gifford

Harold H. Helm

Frederick R. Kappel

*John H. Laragh, M.D.

Augustus C. Long

Alfred L. Loomis, Jr.

Frederick A. O. Schwarz

Thomas H. Choate, *Co-Chairman*

*Frank E. Stinchfield, M.D.

Joseph A. Thomas

Cyrus R. Vance, *ex-officio*

James W. Walker

Sidney J. Weinberg, Jr.

Robert Winthrop

*ex officio (without vote)

MEDICAL BOARD

Frank E. Stinchfield, M.D., *President*

John H. Laragh, M.D., *Vice President*

Daniel C. Baker, Jr., M.D.

Richard E. Behrman, M.D.

Henrik H. Bendixen, M.D.

A. J. Binkert

Chu H. Chang, M.D.

Solan Chao, M.D.

Mary I. Crawford, R.N., ED.D.

Felix E. Demartini, M.D.

Carolyn R. Denning, M.D.

Arthur Gerard DeVoe, M.D.

Leonard C. Harber, M.D.

Frederic P. Herter, M.D.

Brian F. Hoffman, M.D.

Allen I. Hyman, M.D.

Michael Katz, M.D.

R. N. Kerst

Donald W. King, M.D.

Lawrence C. Kolb, M.D.

John K. Lattimer, M.D.

Sidney Malitz, M.D.

James R. Malm, M.D.

Charles S. Neer, II, M.D.

Hymie I. Nossel, M.D.

Charles A. Ragan, Jr., M.D.

Keith Reemtsma, M.D.

Myron S. Roberts, M.D.

Lewis P. Rowland, M.D.

Edward B. Schlesinger, M.D.

Daniel Sciarra, M.D.

William B. Seaman, M.D.

Ellen F. Silverstein, M.D.

Anneliese L. Sitarz, M.D.

Donald F. Tapley, M.D.

Richard E. Thorner, M.D.

W. Duane Todd, M.D.

Raymond L. Vande Wiele, M.D.

Arthur B. Voorhees, Jr., M.D.

Mary E. Windrow, R.N.

James A. Wolff, M.D.

Edward V. Zegarelli, D.D.S.

Honorary Members

Dana W. Atchley, M.D.

Robert C. Darling, M.D.

D. Anthony D'Esopo, M.D.

John H. Dunnington, M.D.

George W. Fish, M.D.

George H. Humphreys, II, M.D.

Rustin McIntosh, M.D.

H. Houston Merritt, M.D.

Carl T. Nelson, M.D.

J. Lawrence Pool, M.D.

Harry M. Rose, M.D.

Lawrence W. Sloan, M.D.

Alan DeForest Smith, M.D.

Hamilton Southworth, M.D.

Howard C. Taylor, Jr., M.D.

Benjamin P. Watson, M.D.

AUDITING

John A. Gifford, *Chairman*

Hulbert S. Aldrich

Dorrance Sexton

James W. Walker

Robert Winthrop

DOCTORS' OFFICES

Charles M. Steer, M.D., *Chairman*

Charles S. Neer, II, M.D., *Vice-Chairman*

Felix E. Demartini, M.D., *Secretary*

Daniel C. Baker, Jr., M.D.
Harold G. Barker, M.D.
A. J. Binkert
George F. Crikelair, M.D.
William J. Davis, M.D.
Leonard C. Harber, M.D.

Lawrence C. Kolb, M.D.
John K. Lattimer, M.D.
George R. Merriam, Jr., M.D.
Lester A. Mount, M.D.
Milton R. Porter, M.D.

Charles A. Ragan, Jr., M.D.
Lewis P. Rowland, M.D.
Gilbert Simon, M.D.
Frank E. Stinchfield, M.D.
Donald F. Tapley, M.D.
Raymond L. Vande Wiele, M.D.

EMPLOYEE BENEFITS

A. J. Binkert, *Chairman*

C. Douglas Auty, *Secretary*

Richard N. Kerst

Carl R. Wise, M.D.

FINANCE

Roger M. Blough, *Chairman*

Thatcher M. Brown, Jr., *Vice Chairman*

Sidney J. Weinberg, Jr., *Vice Chairman*

Thomas H. Choate
Harold H. Helm

Joseph A. Thomas
Robert Winthrop

NOMINATING

Roger M. Blough, *Chairman*

Thatcher M. Brown, Jr.
Thomas H. Choate
Mrs. Edward H. Gerry

Dorrance Sexton
Mrs. Henry C. Taylor
James W. Walker

PLANNING AND REAL ESTATE

Frederick R. Kappel, *Chairman*

John E. Bierwirth
Thatcher M. Brown, Jr.
James M. Clark
John A. Gifford
Peter Grimm

Samuel W. Meek
Thomas P. F. Milbank
Charles S. Munson
Benjamin Strong
Joseph A. Thomas

Kenneth C. Towe

The Presbyterian Hospital in the City of New York

Women's Auxiliaries

The Presbyterian Hospital in the City of New York

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

(Including Cribside Social Service Committee)

Officers

Mrs. Carll Tucker, Jr., *President*
Mrs. Carll Tucker, *Honorary Vice-President*
Mrs. William E. Hill, *Vice-President*
Mrs. Grover O'Neill, Jr., *Vice-President*
Mrs. Keith Moffat, *Treasurer*
Mrs. William B. Rand, *Recording Secretary*
Mrs. Harry W. Havemeyer, *Assistant Recording Secretary*
Mrs. Andrew C. Wetmore, *Corresponding Secretary*
Mrs. Bayard Walker, *Assistant Corresponding Secretary*
Mrs. William E. Hill, *Chairman, Cribside Social Service Committee*
Mrs. K. Herluf Trudso, *Chairman, Cribside Thrift Shop Committee*

Active Members

Mrs. Munn Baker
Mrs. Melvin L. Bedrick
Mrs. Jean Pierre Bigotte
Mrs. Neville J. Booker
Mrs. B. Rionda Braga
Mrs. Bradley I. Collins
Mrs. Casimir deRham
Mrs. Frederic F. deRham
Miss Ethel F. Donaghue
Miss Doris Duke
Mrs. Leo C. Fennelly
Mrs. Franklyn Griffin
Mrs. Melvin M. Grumbach
Mrs. Adlai S. Hardin, Jr.
Mrs. Harry W. Havemeyer

Mrs. Fred L. Heyes
Mrs. William E. Hill
Mrs. Herman L. Hoops
Mrs. Iredell W. Iglehart
Miss Hope Kingsley
Mrs. James McCosh Magie
Mrs. Bradley Manice
Mrs. Allen F. Maulsby
Mrs. Joseph V. McMullan
Mrs. Luiz Meirellas
Mrs. Manton B. Metcalf, Jr.
Miss Dorothy Mills
Mrs. Keith Moffat
Mrs. Orson Munn, Jr.
Mrs. Grover O'Neill

Mrs. Grover O'Neill, Jr.
Mrs. Felix R. Pierot
Mrs. William Rand
Mrs. R. Peter Rose
Mrs. Thomas V. Santulli
Mrs. Daniel B. Strickler, Jr.
Mrs. Henry C. Taylor
Mrs. John S. Tilney
Mrs. K. Herluf Trudso
Mrs. Carll Tucker
Mrs. Carll Tucker, Jr.
Mrs. Bayard W. Walker
Mrs. John L. Weinberg
Mrs. Andrew C. Wetmore

Associate Members

Mrs. Anne T. Broadhurst
Mrs. Robert Brooks
Mrs. Benjamin Coates
Mrs. Lewis B. Harder

Mrs. J. Taylor Howell
Mrs. Munn Kellogg
Mrs. Howard McAteer

Mrs. Rodman B. Montgomery
Mrs. George G. Tenney
Mrs. William Thompson
Mrs. Douglas Williams

NEUROLOGICAL INSTITUTE AUXILIARY

Mrs. Frank T. Weston, *Chairman*
 Mrs. Hart Fessenden, *1st Vice-Chairman*
 Mrs. Gavin K. MacBain, *2nd Vice-Chairman*
 Mrs. Sidney J. Weinberg, Jr., *Recording Secretary*
 Mrs. Niels L. Low, *Corresponding Secretary*
 Mrs. Carl Chadsey, Jr., *Treasurer*

Active Members

Mrs. Charles E. Adams	Mrs. Rush Harrison Kress	Mrs. Lewis P. Rowland
Mrs. Alvin G. Brush	Mrs. Niels L. Low	Mrs. John E. Scarff
Mrs. Carter L. Burgess	Mrs. Gavin K. MacBain	Mrs. Edward B. Schlesinger
Mrs. Royall G. Cannaday	Mrs. James C. Mackenzie	Mrs. George A. Spater
Mrs. Carl Chadsey, Jr.	Mrs. Richard L. Masland	Mrs. John Hoyt Stookey
Mrs. James W. Correll	Mrs. Rollo J. Masselink	Mrs. Charles E. Stroud
Mrs. Hart Fessenden	Mrs. H. Houston Merritt	Mrs. John L. Weinberg
Mrs. Harry Henshel	Mrs. Richard Perry	Mrs. Sidney J. Weinberg, Jr.
Mrs. Paul L. Hertenstein	Mrs. Henry A. Riley	Mrs. Frank T. Weston
Mrs. Lawrence C. Kolb		Mrs. Earl Kress Williams

Associate Members

Mrs. Edith M. Achilles	Mrs. Ralph Cordiner	Mrs. J. Lawrence Pool
Mrs. Roger M. Blough	Mrs. William W. Foshay	Mrs. H. McLeod Riggins
Mrs. Charles P. Cooper	Mrs. Robert James Lewis	Mrs. John Sloane
Mrs. H. S. Fenimore Cooper		Mrs. Willis D. Wood

Honorary Members

Mrs. Charles S. Munson	Mrs. Stuart D. Preston	Mrs. Walter N. Rothschild
------------------------	------------------------	---------------------------

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL

Mrs. Francis H. Cabot, *Chairman*
 Mrs. John VanB. Dean, *Vice-Chairman*
 Mrs. Gilbert J. Vosburgh, *Vice-Chairman*
 Mrs. David L. Andrews, *Treasurer*
 Mrs. Bruce D. Williams, *Recording Secretary*
 Mrs. Charles F. Morgan, *Corresponding Secretary*

Active Members

Mrs. David L. Andrews	Mrs. John VanB. Dean	Mrs. Robert S. Grinnell
Mrs. Frederick R. Bailey	Mrs. Andrew deRoeth, Jr.	Mrs. Hilary H. Holmes
Mrs. C. Redington Barrett	Mrs. Arthur Gerard DeVoe	Mrs. Calderon Howe
Mrs. Ralph H. Boots	Mrs. Richard B. Duane, Jr.	Mrs. George H. Humphreys, II
Mrs. Harold W. Brown	Mrs. William Dunaway	Mrs. Allen I. Hyman
Mrs. Joseph A. Buda	Mrs. Robert H. E. Elliott, Jr.	Mrs. Frode Jensen
Mrs. Thomas A. Burke	Mrs. Robert M. Ellsworth	Ms. Joyce P. Kinney
Mrs. Francis H. Cabot	Mrs. Carl R. Feind	Mrs. John G. Leness
Mrs. George A. Carden	Mrs. Charles A. Flood	Mrs. Francis A. L'Esperance, Jr.
Mrs. E. Foster Conklin	Mrs. Max Forbes	Mrs. James C. Manny
Mrs. William C. Cooper	Mrs. Henry Clay Frick, II	Mrs. Paul A. Marks
Mrs. Howard R. Craig	Mrs. John E. Gaines	Mrs. Malcolm H. McAllister
Mrs. Virgil G. Damon	Mrs. William H. Gorman, II	Mrs. George W. Melcher, Jr.
Mrs. Douglas S. Damrosch		Mrs. George R. Merriam, Jr.

Active Members

Mrs. Charles F. Morgan
Mrs. Equinn W. Munnell
Mrs. Charles S. Neer, II
Mrs. Carl T. Nelson
Mrs. George A. Perera
Mrs. Albert Rowland Perry, Jr.
Mrs. John B. Price, Jr.
Mrs. Robin M. Rankow
Mrs. John N. Schullinger

Mrs. Rudolph N. Schullinger
Mrs. Joseph A. Silverman
Mrs. Hamilton Southworth
Mrs. Hamilton Southworth, Jr.
Mrs. Frank E. Stinchfield
Mrs. Hardwick Stires
Mrs. W. Duane Todd
Mrs. Cornelius J. Tyson, Jr.
Mrs. Raymond L. Vande Wiele

Mrs. Gilbert J. Vosburgh
Mrs. John D. Warren
Mrs. Richard Weil, III
Mrs. Maynard C. Wheeler
Mrs. Richard B. White
Mrs. Richard L. White
Mrs. Robert T. Whitlock
Mrs. Philip D. Wiedel
Mrs. Bruce D. Williams

Associate Members

Mrs. Dana T. Bartholomew
Mrs. Arthur H. Blakemore
Mrs. Howard G. Bruenn
Mrs. Graham Clark
Mrs. W. Van Alan Clark
Mrs. Stuart W. Cosgriff
Mrs. William J. Demorest
Mrs. Alvin Devereux
Mrs. Frederick A. Dewey
Mrs. C. Dary Dunham
Mrs. John H. Dunnington
Mrs. Jose M. Ferrer

Mrs. Cadvan O. Griffiths, Jr.
Mrs. Harold D. Harvey
Mrs. Leo R. Heiden
Mrs. Richard A. Kimball, Jr.
Mrs. William Kirk
Miss Deborah Van D. Kneeland
Mrs. Yale Kneeland, Jr.
Mrs. Richard J. Kossmann
Mrs. I. L. Kramer
Mrs. Samuel W. Lambert, Jr.
Mrs. James R. Malm
Mrs. David H. McAlpin

Mrs. Robert B. McGraw
Mrs. Charles A. McKendree
Mrs. George G. Montgomery, J
Mrs. Craven Nichols
Mrs. Milton R. Porter
Mrs. Algernon B. Reese
Mrs. Louis M. Rousselot
Mrs. Edward B. Self
Mrs. Paul B. Sheldon
Mrs. Richard deL. Simmons
Mrs. Richard J. Stock
Mrs. George H. Wilkie

Junior Associate Members

Mrs. John W. Barnum

Mrs. Robert G. Blabey, Jr.
Mrs. John W. Espy

Mrs. Frank R. Smith

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL

Mrs. Robert E. Carroll, *President*
Mrs. Jarvis J. Slade, *2nd Vice-President*
Mrs. Hugo A. Keim, *Secretary*

Mrs. George S. Johnston, Jr., *1st Vice-President*
Mrs. William L. Hutton, *3rd Vice-President*
Mrs. Keith Highet, *Treasurer*

Active Members

Mrs. Robert E. Carroll
Mrs. Thomas H. Choate
Mrs. Jane R. Condliffe
Mrs. E. Allen Dennison
Mrs. John R. Drexel, IV
Mrs. Edward H. Gerry
Mrs. Charles B. Grosvenor

Mrs. Keith Highet
Mrs. Thomas Hitchcock
Mrs. William L. Hutton
Mrs. George S. Johnston, Jr.
Mrs. Hugo A. Keim
Mrs. William G. Maguire
Mrs. Walter H. Mann, Jr.

Mrs. James O'Malley, Jr.
Mrs. Willis L. M. Reese
Mrs. Jarvis J. Slade
Mrs. John R. Stevenson
Mrs. Prentice Talmage, Jr.
Mrs. George Tilghman
Mrs. Donald Wallace

Associate Members

Mrs. William Cary
Mrs. G. Ronald Furse
Mrs. Reed Gillespie

Mrs. Alfred C. Harrison
Mrs. Samuel Reed

Mrs. Bearns Smith
Mrs. Peter Stephaich
Mrs. Caleb C. Whitaker

Honorary Members

Mrs. C. Suydam Cutting

Mrs. Sheldon Whitehouse

Members of the Corporation

The Presbyterian Hospital in the City of New York

Mrs. Edith M. Achilles
 Mrs. Charles E. Adams
 James Seybold Adams
 Hulbert S. Aldrich
 Malcolm P. Aldrich
 Robert B. Anderson
 Mrs. David L. Andrews
 Edward H. Auchincloss
 James C. Auchincloss
 Mrs. Frederick R. Bailey
 Mrs. Munn Baker
 Robert H. B. Baldwin
 Mrs. C. Redington Barrett
 Mrs. Dana T. Bartholomew
 Chauncey Belknap
 August Belmont
 Edward C. Bench
 John E. Bierwirth
 A. J. Binkert
 Mrs. Arthur H. Blakemore
 Roger M. Blough
 Mrs. Roger M. Blough
 Mrs. Neville J. Booker
 Mrs. Ralph H. Boots
 Nicholas F. Brady
 Mrs. B. Rionda Braga
 Edward C. Brewster
 Mrs. Anne T. Broadhurst
 John W. Brooks
 Mrs. Robert Brooks
 Mrs. Harold W. Brown
 Mrs. Thatcher M. Brown, Jr.
 Mrs. Howard G. Bruenn
 Mrs. Alvin G. Brush
 Charles W. Buek
 Carter L. Burgess
 Mrs. Carter L. Burgess
 W. Randolph Burgess
 John S. Burke, Jr.
 Mrs. Thomas A. Burke
 Mrs. Francis H. Cabot
 Mrs. Royall G. Cannaday
 Mrs. George A. Carden
 Mrs. William Cary
 Mrs. Carl Chadsey, Jr.
 Gilbert W. Chapman
 William H. Chisholm
 Thomas H. Choate
 Mrs. Thomas H. Choate
 Mrs. Graham Clark
 Howard L. Clark
 James M. Clark
 Mrs. W. Van Alan Clark
 Lucius D. Clay
 Mrs. Benjamin Coates
 Mrs. Bradley I. Collins
 Samuel Sloan Colt
 Mrs. Jane R. Condliffe
 Mrs. Charles P. Cooper

Mrs. H. S. Fenimore Cooper
 Roy F. Coppedge, Jr.
 Mrs. Ralph Cordiner
 Mrs. Stuart W. Cosgriff
 W. Sheffield Cowles
 Cleo F. Craig
 Mrs. Howard R. Craig
 George A. Crocker
 Mrs. Allerton Cushman
 Mrs. C. Suydam Cutting
 Mrs. Virgil G. Damon
 Arthur H. Dean
 Mrs. William J. Demorest
 Mrs. E. Allen Dennison
 Mrs. Casimir deRham
 Mrs. Frederic F. deRham
 Mrs. Alvin Devereux
 Arthur Gerard DeVoe, M.D.
 Mrs. Arthur Gerard DeVoe
 Mrs. Frederick A. Dewey
 C. Douglas Dillon
 George S. Dillon
 Miss Ethel Donaghue
 Frederic G. Donner
 Mrs. Richard B. Duane, Jr.
 Miss Doris Duke
 Mrs. William D. Dunaway
 Mrs. C. Dary Dunham
 Mrs. John H. Dunnington
 Fredrick M. Eaton
 Mrs. Robert H. E. Elliott, Jr.
 James A. Farmer
 Mrs. Leo C. Fennelly
 Mrs. Jose M. Ferrer
 Mrs. Hart Fessenden
 Mrs. Charles A. Flood
 Thomas C. Fogarty
 James W. Foley
 Mrs. William W. Foshay
 John M. Franklin
 Mrs. Henry Clay Frick, II
 G. Keith Funston
 Mrs. G. Ronald Furse
 Henry W. Gadsden
 Artemus L. Gates
 Mrs. Edward H. Gerry
 John A. Gifford
 Mrs. Reed Gillespie
 Mrs. William H. Gorman, II
 Maurice F. Granville
 George Lauder Greenway
 Mrs. Franklyn Griffin
 Mrs. Cadvan O. Griffiths, Jr.
 Peter Grimm
 Mrs. Robert S. Grinnell
 John S. Griswold
 W. E. S. Griswold, Jr.
 Mrs. Charles B. Grosvenor
 Mrs. Melvin M. Grumbach

Perry E. Hall
 Mrs. Lewis B. Harder
 Charles Barney Harding
 Mrs. Rebekah Harkness
 E. Roland Harriman
 Mrs. Alfred C. Harrison
 Mrs. Harold D. Harvey
 Mrs. Harry W. Havemeyer
 Mrs. Leo R. Heiden
 Harold H. Helm
 Mrs. Fred L. Heyes
 Mrs. William E. Hill
 Mrs. Thomas Hitchcock
 Mrs. Hilary H. Holmes
 Mrs. Herman L. Hoops
 Arthur Amory Houghton, Jr.
 Mrs. Calderon Howe
 Mrs. J. Taylor Howell
 Mrs. George H. Humphreys, II
 Mrs. William L. Hutton
 Mrs. Iredell W. Iglehart
 Mrs. George S. Johnston, Jr.
 Frederick R. Kappel
 Mrs. Munn Kellogg
 Miss Hope Kingsley
 Ms. Joyce P. Kinney
 Mrs. Grayson Kirk
 Mrs. William Kirk
 Mrs. Yale Kneeland, Jr.
 Mrs. Lawrence C. Kolb
 Mrs. Richard J. Kossmann
 Mrs. I. L. Kramer
 Mrs. Rush Harrison Kress
 Mrs. Samuel W. Lambert, Jr.
 Ralph F. Leach
 Mrs. John G. Leness
 Mrs. Francis A. L'Esperance, Jr.
 Mrs. Robert James Lewis
 Augustus C. Long
 Alfred L. Loomis, Jr.
 Robert A. Lovett
 Ranald H. Macdonald
 Mrs. James C. Mackenzie
 Mrs. James McCosh Magie
 Mrs. William G. Maguire
 Mrs. James R. Malm
 Mrs. Bradley Manice
 Mrs. James C. Manny
 Paul A. Marks, M.D.
 Mrs. Richard L. Masland
 Birny Mason, Jr.
 Mrs. Rollo J. Masselink
 Mrs. Allen F. Maulsby
 Mrs. Malcolm H. McAllister
 David H. McAlpin
 Mrs. David H. McAlpin
 Mrs. Howard McAteer
 Mrs. Robert B. McGraw
 Mrs. Charles A. McKendree

Mrs. Joseph V. McMullan
 Samuel W. Meek
 Mrs. Luiz Meirellas
 H. Houston Merritt, M.D.
 Mrs. H. Houston Merritt
 Mrs. Manton B. Metcalf, Jr.
 Mrs. Clifford W. Michel
 Thomas P. F. Milbank
 Miss Dorothy Mills
 Mrs. Keith Moffat
 Mrs. George G. Montgomery, Jr.
 Mrs. Robert Montgomery
 Mrs. Rodman B. Montgomery
 Mrs. Charles F. Morgan
 Charles G. Mortimer
 Mrs. J. Malcolm Muir
 Robert H. Mulreany
 Milton C. Mumford
 Mrs. Orson Munn
 Charles S. Munson
 Mrs. Charles S. Munson
 Charles S. Munson, Jr.
 Robert D. Murphy
 Mrs. Charles S. Neer, II
 Mrs. Carl T. Nelson
 Quigg Newton
 Mrs. Craven Nichols
 Albert L. Nickerson
 Mrs. James O'Malley, Jr.
 Mrs. Grover O'Neill
 Mrs. Grover O'Neill, Jr.
 Mrs. William S. Paley
 Henry Parish, 2nd
 Richard K. Paynter, Jr.
 Charles S. Payson
 Mrs. George A. Perera
 Mrs. Richard Perry
 Mrs. Felix R. Pierot
 Francis T. P. Plimpton
 Mrs. J. Lawrence Pool
 J. Lenox Porter
 Mrs. Milton R. Porter
 Percy R. Pyne, III
 Charles A. Ragan, Jr. M.D.
 M. J. Rathbone

Philip D. Reed
 Mrs. Samuel Reed
 Mrs. Algernon B. Reese
 Mrs. Willis L. M. Reese
 Mrs. H. McLeod Riggins
 Mrs. Henry A. Riley
 Charles S. Robertson
 R. Peter Rose
 Mrs. R. Peter Rose
 Mrs. Walter N. Rothschild
 Mrs. Louis M. Rousselot
 Mrs. Fortune Peter Ryan
 Mrs. Thomas V. Santulli
 Mrs. John E. Scarff
 Mrs. Edward B. Schlesinger
 Mrs. John N. Schullinger
 Mrs. Rudolph N. Schullinger
 Frederick A. O. Schwarz
 William B. Seaman, M.D.
 Mrs. Edward B. Self
 Dorrance Sexton
 Mrs. Paul B. Sheldon
 Mrs. Richard deL. Simmons
 Mrs. Jarvis J. Slade
 Mrs. John Sloane
 Mrs. Bearns Smith
 Mrs. Hamilton Southworth
 Mrs. George A. Spater
 Charles M. Spofford
 Mrs. Peter Stephaich
 John P. Stevens, Jr.
 Mrs. John R. Stevenson
 William E. Stevenson
 Mrs. William E. Stevenson
 Edward Ellsworth Stewart
 Charles L. Stillman
 Frank E. Stinchfield, M.D.
 Mrs. Frank E. Stinchfield
 Mrs. Hardwick Stires
 Mrs. Richard J. Stock
 Mrs. John Hoyt Stookey
 Benjamin Strong
 Mrs. Charles E. Stroud
 Frederick Sturges, Jr.

Charles H. Symington, Jr.
 Mrs. Prentice Talmage, Jr.
 Mrs. Henry C. Taylor
 W. R. K. Taylor, Jr.
 Mrs. George G. Tenney
 Joseph A. Thomas
 Mrs. William Thompson
 Mrs. John S. Tilney
 Mrs. W. Duane Todd
 Kenneth C. Towe
 John C. Traphagen
 Mrs. K. Herluf Trudso
 Mrs. Carll Tucker
 Mrs. Carll Tucker, Jr.
 Mrs. Cornelius J. Tyson, Jr.
 Cyrus R. Vance
 Milton L. Van Slyck
 Guido F. Verbeck, Jr.
 Mrs. James P. Vogel
 Mrs. Anton E. Walbridge
 Mrs. Bayard Walker
 James W. Walker
 Mrs. Donald L. Wallace
 Arthur K. Watson
 Lowell P. Weicker
 Mrs. John L. Weinberg
 Sidney J. Weinberg, Jr.
 Mrs. Sidney J. Weinberg, Jr.
 Edwin L. Weisl, Jr.
 Mrs. Andrew C. Wetmore
 Mrs. Maynard C. Wheeler
 Morgan Dix Wheelock
 Mrs. Caleb C. Whitaker
 Mrs. Richard B. White
 Mrs. Richard L. White
 Mrs. Sheldon Whitehouse
 Mrs. Philip D. Wiedel
 Mrs. George H. Wilkie
 Douglas Williams
 Mrs. Douglas Williams
 Mrs. Earl Kress Williams
 Robert Winthrop
 Mrs. Willis D. Wood
 Charles B. Wrightsman
 John M. Young

Administrative Staff

The Presbyterian Hospital in the City of New York

A. J. BINKERT

President

R. N. KERST

Vice President (Administration)

Assistant Secretary-Treasurer

C. DOUGLAS AUTY

Assistant Vice President

Personnel

MARY I. CRAWFORD, R.N.

Director of Nursing

ROBERT H. E. ELLIOTT, JR., M.D.

Assistant Vice President

Special Projects (Nursing)

G. R. MASTEN

Assistant Vice President

Nonprofessional Services

MILTON R. PORTER, M.D.

Assistant Vice President

EDWARD B. SELF, M.D.

Assistant Vice President

Special Projects (Nursing and Allied Health)

JOSEPH E. SNYDER, M.D.

Assistant Vice President

Vanderbilt Clinic and Other Services

CARL R. WISE, M.D.

Assistant Vice President

Professional Services to Patients

Dean Calvert

Administrative Assistant

Food Service and Housekeeping Department

Eugene T. Cleary

Administrative Assistant

Projects and Operations and Maintenance

C. J. Orlando

Assistant Treasurer

R. N. Ott

Assistant Treasurer

N. L. Peters

Comptroller

Winfred Van Atta

Director, Public Interest

Mary E. Windrow, R.N.

Director, Nursing Service

Professional Staff

The Presbyterian Hospital in the City of New York

Professional Staff

Consultants

J. Burns Amberson, M.D.....	Medicine
George C. Andrews, M.D.....	Dermatology
Dana W. Atchley, M.D.....	Medicine
Alvan L. Barach, M.D.....	Medicine
Leslie P. Barker, M.D.....	Dermatology
Viola W. Bernard, M.D.....	Psychiatry
Gordon M. Bruce, M.D.....	Ophthalmology
Howard G. Bruenn, M.D.....	Medicine
John Caffey, M.D.....	Radiology
Mather Cleveland, M.D.....	Orthopedic Surgery
André F. Cournand, M.D.....	Medicine
David Cowen, M.D.....	Pathology
Fritz J. Cramer, M.D.....	Neurological Surgery
George E. Daniels, M.D.....	Psychiatry
Robert C. Darling, M.D.....	Rehabilitation Medicine
D. Anthony D'Esopo, M.D.....	Obstetrics and Gynecology
John H. Dunnington, M.D.....	Ophthalmology
Robert H. E. Elliott, Jr., M.D.....	Surgery
George W. Fish, M.D.....	Urology
Charles A. Flood, M.D.....	Medicine
Ross Golden, M.D.....	Radiology
Paul Gross, M.D.....	Dermatology
†A. David Gurewitsch, M.D.....	Rehabilitation Medicine
Cushman D. Haagensen, M.D.....	Surgery
Paul F. A. Hoefer, M.D.....	Neurology
George H. Humphreys, II, M.D.....	Surgery
Harold W. Jacox, M.D.....	Radiology
William S. Langford, M.D.....	Pediatrics
†Maurice Lenz, M.D.....	Radiology
Robert L. Levy, M.D.....	Medicine
Rustin McIntosh, M.D.....	Pediatrics
H. Houston Merritt, M.D.....	Neurology
J. Lowry Miller, M.D.....	Dermatology
Richmond L. Moore, M.D.....	Surgery
Carl T. Nelson, M.D.....	Dermatology
Carl R. Oman, D.D.S.....	Dentistry
Charles A. Perera, M.D.....	Ophthalmology
Phillip Polatin, M.D.....	Psychiatry
J. Lawrence Pool, M.D.....	Neurological Surgery
Algernon B. Reese, M.D.....	Ophthalmology
Harry M. Rose, M.D.....	Medicine
John E. Scarff, M.D.....	Neurological Surgery
Albin R. Seidel, D.M.D.....	Dentistry
Lawrence W. Sloan, M.D.....	Surgery
Alan DeForest Smith, M.D.....	Orthopedic Surgery
Gilbert P. Smith, D.D.S.....	Dentistry
William B. Snow, M.D.....	Rehabilitation Medicine
Hamilton Southworth, M.D.....	Medicine
Howard C. Taylor, Jr., M.D.....	Obstetrics and Gynecology
Royal C. Van Etten, M.D.....	Obstetrics and Gynecology
Benjamin P. Watson, M.D.....	Obstetrics and Gynecology
Jerome P. Webster, M.D.....	Surgery
Maynard C. Wheeler, M.D.....	Ophthalmology
‡Sigmund L. Wilens, M.D.....	Pathology
Abner Wolf, M.D.....	Pathology
DeGraaf Woodman, M.D.....	Otolaryngology
Robert H. Wylie, M.D.....	Surgery

Anesthesiology Service

DIRECTOR OF SERVICE

Henrik H. Bendixen, M.D.

ATTENDING ANESTHESIOLOGISTS

*Leonard Brand, M.D.

Edgar C. Hanks, M.D.

Jacob S. Israel, M.D.

Lester C. Mark, M.D.

Gabriel G. Nahas, M.D.

Shih-Hsun Ngai, M.D.

Herbert Rackow, M.D.

Ernest Salanitri, M.D.

James F. Schauble, M.D.

ASSOCIATE ATTENDING

ANESTHESIOLOGISTS

Mieczyslaw Finster, M.D.

Joannes H. Karis, M.D.

Paul J. Poppers, M.D.

Charles E. Wolf, M.D.

ASSISTANT ATTENDING

ANESTHESIOLOGISTS

Dorothy A. Black, M.D.

Kathryn A. W. Cozine, M.D.

Robert T. Donham, M.D.

Ralph A. Epstein, M.D.

Bernard E. Filner, M.D.

Carolyn P. Greenberg, M.D.

Allen I. Hyman, M.D.

Hoshang Jal Khambatta, M.D.

Raymond B. Laravuso, M.D.

Vance Lauderdale, Jr., M.D.

Krishan Malik, M.D.

Shirley J. Markee, M.D.

Richard S. Matteo, M.D.

Eugene J. Pantuck, M.D.

Hilda Pedersen, M.D.

Daniel M. Pino, M.D.

J. Gilbert Stone, M.D.

Joseph C-S. Yang, M.D.

ASSISTANT ANESTHESIOLOGISTS

Gerald L. Feinberg, M.D.

Ernst Heilbrunn, M.D.

Anthony J. Salvatore, M.D.

Anthony E. Wickremesinghe, M.D.

ASSISTANT RESIDENTS

Nelly F. Abadir, M.D.

Sami A. Abadir, M.D.

Jasjit B. Atwal, M.D.

James W. Bland, M.D.

Samir B. Botros, M.D.

Octavio Camasura, M.D.

Stephen J. Dallolio, M.D.

Antonita deJesus, M.D.

Francisco S. DeLeon, M.D.

Arthur D. Finck, M.D.

Mario S. Galassi, M.D.

Erlinda S. Gambito, M.D.

Yakub M. Gangat, M.D.

Patricia W. Hartwell, M.D.

Richard N. Heyendal, M.D.

Shih-piao Hsu, M.D.

Young Hur, M.D.

Alexander R. Kehayes, M.D.

Chen-Jen Kuo, M.D.

Mohan H. Kulkarni, M.D.

Jenq-Min Lai, M.D.

Hsin-Chao Lee, M.D.

In Soo Lee, M.D.

Guillermo Leon, M.D.

Youssef Lichaa, M.D.

Frank M. Lin, M.D.

Anselma C. Loreda-Canlas, M.D.

J. A. Jeevendra Martyn, M.D.

Corazon Maurrasse, M.D.

Ahmed A. Mohsen, M.D.

Ali H. Nagai, M.D.

Habib A. Oscoff, M.D.

Narendra Parson, M.D.

Carmelino C. Payumo, M.D.

Luzviminda Pinpin, M.D.

† Deceased

* Leave of Absence

ASSISTANT RESIDENTS (continued)

Estella K. Pua, M.D.
 Rene R. Rigal-Lizardi, M.D.
 Winnie B. Siatong, M.D.
 Shih-Hui Tien, M.D.
 Sidney O. Veitch, M.D.
 Carmen M. Villaluz, M.D.
 Rey O. Villanueva, M.D.
 Mark A. Wightman, M.D.
 Il Sung Won, M.D.
 Jen Tien Wung, M.D.
 Chen-Ping Yang, M.D.
 Reda A. Zakhary, M.D.

VISITING FELLOWS

Chen-Kuo Kao, M.D.
 Saidel Laine, M.D.
 Leila M. Pang, M.D.
 David H. Sprague, M.D.
 Joseph C. Yang, M.D.

Dental Service**DIRECTOR OF SERVICE**

Edward V. Zegarelli, D.D.S.

ATTENDING DENTAL SURGEONS

Edward A. Cain, Jr., D.D.S.
 Nicholas A. DiSalvo, D.D.S.
 Robert Gottsegen, D.D.S.
 John J. Lucca, D.D.S.
 Melvin L. Moss, D.D.S.
 †George L. O'Grady, D.D.S.
 †Solomon N. Rosenstein, D.D.S.

ASSOCIATE ATTENDING DENTAL SURGEONS

Sebastian A. Bruno, D.D.S.
 Jack Budowsky, D.D.S.
 †Lester R. Cahn, D.D.S.
 Victor S. Caronia, D.D.S.
 Joseph A. Cuttita, D.D.S.
 Louis J. Loscalzo, D.D.S.
 Irwin D. Mandel, D.D.S.
 Louis Mandel, D.D.S.
 Joseph J. Marbach, D.D.S.
 George A. Minervini, D.D.S.
 Ennio L. Uccellani, D.D.S.

ASSISTANT ATTENDING DENTAL SURGEONS

Jacob Abelson, D.D.S.
 Jerome Bartwink, D.D.S.
 Stanislaw H. Brzustowicz, D.D.S.
 Kourken A. Daglian, D.D.S.
 Joseph A. DeJulia, D.D.S.
 Anthony L. DiMango, D.D.S.
 Martin J. Fields, D.D.S.
 Alvin J. Grayson, D.D.S.
 Sidney L. Horowitz, M.D., D.D.S.
 Ian Yung-Chen Hu, D.D.S.
 Bert Klatskin, D.D.S.
 Austin H. Kutscher, D.D.S.

Inactive

Eugene P. LaSota, D.D.S.
 John Kirk Lind, D.D.S.
 Joseph Luban, D.D.S.
 Michael Z. Marder, D.D.S.
 Henry I. Nahoum, D.D.S.
 Irving J. Naidorf, D.D.S.
 John D. Piro, D.D.S.
 Arnold Rosenberg, D.D.S.
 Fred Rothenberg, D.D.S.
 Daniel D. Schube, D.D.S.
 Murray Schwartz, D.D.S.
 Steven S. Scrivani, D.D.S.
 Arthur Shain, D.D.S.
 Boaz M. Shattan, D.D.S.
 Morton J. Stern, D.D.S.
 Maxwell Widrow, D.D.S.
 David J. Zegarelli, D.D.S.

Dermatology Service**DIRECTOR OF SERVICE**

Leonard C. Harber, M.D.

ATTENDING DERMATOLOGISTS

Irving Abrahams, M.D.
 †Helen O. Curth, M.D.
 Anthony N. Domonkos, M.D.
 Jack Eisert, M.D.
 Saul L. Sanders, M.D.
 Lewis Shapiro, M.D.
 Meyer H. Slatkin, M.D.
 Richard A. Walzer, M.D.
 Alexander W. Young, Jr., M.D.

ASSISTANT ATTENDING DERMATOLOGISTS

William G. Atwood, M.D.
 David R. Bickers, M.D.
 Henry L. Hines, M.D.
 Einar A. Jublin, M.D.
 Theodore A. Labow, M.D.
 Peter C. Lombardo, M.D.
 Maureen B. Poh, M.D.
 Alan R. Shalita, M.D.

ASSOCIATE DERMATOLOGISTS

Marvin Brodey, M.D.
 †William Curth, M.D.
 †Max Liebmman, M.D.

ASSISTANT DERMATOLOGISTS

William R. Barbee, M.D.
 Vincent S. Beltrani, M.D.
 Elaine V. DiGrande, M.D.
 Robert P. Feinstein, M.D.
 †Marie Karelitz-Karry, M.D.
 Burton S. Koplon, M.D.
 Joseph A. Penner, M.D.
 Jack H. Rozen, M.D.
 Joseph S. Shapiro, M.D.
 David Sibulkin, M.D.
 Eva B. Stahl, M.D.
 Hilda G. Straker, M.D.
 Eugene W. Sweeney, M.D.
 Harvey I. Weinberg, M.D.

RESIDENTS

Sidney A. Hochman, M.D.
 Jeffrey J. Kroll, M.D.

ASSISTANT RESIDENTS

Stanley J. Lewis, M.D.
 Gary Salenger, M.D.
 Estelle I. Young, M.D.

VISITING FELLOWS

Mark S. Lichtenberg, M.D.
 Louis Lopyan, M.D.
 Roland Nesi, M.D.
 John Stricks, M.D.
 Harvey Weinberg, M.D.

Medical Service**DIRECTOR OF SERVICE**

Charles A. Ragan, Jr., M.D.

ATTENDING PHYSICIANS

Henry Aranow, Jr., M.D.
 Stanley E. Bradley, M.D.
 Robert E. Canfield, M.D.
 Stuart W. Cosgriff, M.D.
 Felix E. Demartini, M.D.
 M. Irené Ferrer, M.D.
 Andrew G. Frantz, M.D.
 DeWitt S. Goodman, M.D.
 Rejane M. Harvey, M.D.
 Robert S. Krooth, M.D.
 John H. Laragh, M.D.
 Edgar Leifer, M.D.
 Paul A. Marks, M.D.
 Hymie L. Nossel, M.D.
 Elliott F. Osserman, M.D.
 Richard A. Rifkind, M.D.
 John V. Taggart, M.D.
 Donald F. Tapley, M.D.
 Gerard M. Turino, M.D.
 Sidney C. Werner, M.D.
 Arthur R. Wertheim, M.D.

ASSOCIATE ATTENDING PHYSICIANS

Arthur Bank, M.D.
 John T. Bigger, Jr., M.D.
 Vincent P. Butler, Jr., M.D.
 Peter R. B. Caldwell, M.D.
 Paul J. Cannon, M.D.
 †George A. Carden, M.D.
 Nicholas P. Christy, M.D.
 Edward E. Fischel, M.D.
 Shirley C. Fisk, M.D.
 Albert W. Grokoest, M.D.
 Donald A. Holub, M.D.
 George A. Hyman, M.D.
 Abbie I. Knowlton, M.D.
 John S. Kovach, M.D.
 Robert A. Kritzer, M.D.
 Albert R. Lamb, Jr., M.D.
 †Samuel W. Lambert, Jr., M.D.
 †James L. Leland, M.D.

ASSOCIATE ATTENDING PHYSICIANS
(continued)

E. Carwile LeRoy, M.D.
 John Lindenbaum, M.D.
 John N. Loeb, M.D.
 John H. McClement, M.D.
 George H. McCormack, Jr., M.D.
 George W. Melcher, Jr., M.D.
 Jay I. Meltzer, M.D.
 Thomas Q. Morris, M.D.
 †Arthur E. Neergaard, M.D.
 Harold C. Neu, M.D.
 Robert P. Noble, M.D.
 Ann S. Peterson, M.D.
 Kermit L. Pines, M.D.
 Richard Rivlin, M.D.
 †Bertram J. Sanger, M.D.
 †Paul B. Sheldon, M.D.
 †Martin DeForest Smith, M.D.
 Richard J. Stock, M.D.
 Gerald E. Thomson, M.D.
 Theodore B. Van Itallie, M.D.
 I. Bernard Weinstein, M.D.
 †Herbert B. Wilcox, Jr., M.D.
 John A. Wood, M.D.

ASSISTANT ATTENDING PHYSICIANS

Casco Alston, M.D.
 Leslie P. Baer, M.D.
 John F. Bertles, M.D.
 Hylan A. Bickerman, M.D.
 John L. Buchanan, M.D.
 John O. Burris, M.D.
 Robert B. Case, M.D.
 Michael H. Cohen, M.D.
 Henry Colcher, M.D.
 Clarence J. D'Alton, M.D.
 John Van B. Dean, M.D.
 Robert H. DeBellis, M.D.
 Richard B. Duane, Jr., M.D.
 Yale Enson, M.D.
 Charles D. Faverio, M.D.
 Michael H. Grieco, M.D.
 Lionel Grossbard, M.D.
 Wendell B. Hatfield, M.D.
 Wylie Hembree, M.D.
 George C. Hennig, M.D.
 Peter R. Holt, M.D.
 Daniel L. Larson, M.D.
 Roger L. Lerner, M.D.
 William P. Lovejoy, M.D.
 William M. Manger, M.D.
 James A. L. Mathers, M.D.
 David J. McConnell, M.D.
 Jane H. Morse, M.D.
 Hans W. Neuberg, M.D.
 Gerald B. Phillips, M.D.
 Marshall P. Primack, M.D.
 Dudley F. Rochester, M.D.
 John L. Roglieri, M.D.
 Norton S. Rosensweig, M.D.
 Donald H. Schmidt, M.D.
 Peter E. Schrag, M.D.
 Howard B. Shookhoff, M.D.

Frank R. Smith, M.D.
 †William H. Stearns, M.D.
 Jeffrey A. Stein, M.D.
 Alfred Steiner, M.D.
 Kenneth Sterling, M.D.
 Joseph G. Sweeting, M.D.
 Henry M. Thomas, III, M.D.
 Cornelius J. Tyson, M.D.
 †Paul Wermer, M.D.
 Earl A. Wheaton, Jr., M.D.
 Robert T. Whitlock, M.D.
 Carl R. Wise, M.D.

ASSOCIATE PHYSICIANS

Stewart F. Alexander, M.D.
 John T. Beaty, M.D.
 Cristobal A. Vicens, M.D.

ASSISTANT PHYSICIANS

Richard P. Ames, M.D.
 †Alice T. Baker, M.D.
 Howard J. Barnum, M.D.
 C. Redington Barrett, Jr., M.D.
 Eli Bauman, M.D.
 Gustav J. Beck, M.D.
 Alfred Becker, M.D.
 Ralph S. Blume, M.D.
 Carol H. Bosken, M.D.
 Geraldine P. Bradley, M.D.
 George C. Branche, Jr., M.D.
 Norma Mai Tsen Wang Braun, M.D.
 James A. Brown, M.D.
 Jay Brown, M.D.
 John S. Britten, M.D.
 †Winifred Bronson, M.D.
 Marcia B. Bull, M.D.
 Bernard C. Burnett, M.D.
 Nicholas A. Cannarozzi, M.D.
 Daniel S. J. Choy, M.D.
 James A. Coss, Jr., M.D.
 †Lawrence H. Cotter, M.D.
 James K. Cunningham, M.D.
 Paul Cushman, M.D.
 John M. Daley, M.D.
 Ronald E. Drusin, M.D.
 †Erna S. Enderle, M.D.
 Dorothy A. Erickson, M.D.
 Dorothy Estes, M.D.
 Mehdi Farhangi, M.D.
 Lloyd C. Fisher, M.D.
 Helen-Ann Garcia, M.D.
 †Claudio Gerbi, M.D.
 Elsa-Grace Vonna Giardina, M.D.
 Irwin Goldstein, M.D.
 Jonas M. Goldstone, M.D.
 Lonnie B. Hanauer, M.D.
 Robert H. Heissenbuttel, M.D.
 Joseph Heller, M.D.
 Ralph J. Herz, Jr., M.D.
 James A. Hogan, M.D.
 Ginette B. Jacob, M.D.
 Paul K. Johnson, M.D.
 Elias M. Kaimklotis, M.D.
 Margaret M. Kilcoyne, M.D.

Paul Killian, M.D.
 Robert L. Kozam, M.D.
 Joel Kupersmith, M.D.
 Constantine P. Ladopoulos, M.D.
 Marianne J. Legato, M.D.
 Arthur J. Lennon, M.D.
 Marvin M. Lipman, M.D.
 Arnold L. Lisio, M.D.
 Daniel L. Macken, M.D.
 Pier L. Mancusi-Ungaro, M.D.
 Hildegard R. Maricq, M.D.
 Mato L. Marinovich, M.D.
 Kenneth A. McClane, M.D.
 Clayton L. Natta, M.D.
 Marc E. Newberg, M.D.
 Carmen Ortiz-Neu, M.D.
 Richard N. Pierson, Jr., M.D.
 F. Xavier Pi-Sunyer, M.D.
 Eduardo R. Pons, Jr., M.D.
 John E. Postley, Jr., M.D.
 Kenneth M. Prager, M.D.
 Milovan T. Rakic, M.D.
 Morris R. Rapoport, M.D.
 James A. Reiffel, M.D.
 Edith B. Reilly, M.D.
 Stephan R. Rheingold, M.D.
 John M. Rodgers, M.D.
 Robert B. Roven, M.D.
 Alan L. Saroff, M.D.
 Harvey A. Schneier, M.D.
 Nathaniel Selleck, M.D.
 Joyce C. Shaver, M.D.
 Lewis M. Slater, M.D.
 Arthur I. Snyder, M.D.
 Theodore J. Stahl, M.D.
 Julio E. Sotelo, M.D.
 Helen Van Alstine, M.D.
 Melvin B. Weiss, M.D.
 Gail S. Williams, M.D.
 Stuart H. Young, M.D.

CHIEF PODIATRIST

†Michael J. Petti, Pod.D.

PODIATRISTS

Bernard Rosenstein, Pod.D.
 John J. Slevin, Pod.D.

RESIDENTS

William M. Lee, M.D.
 Michael F. Parry, M.D.

ASSISTANT RESIDENTS

Gerald B. Appel, M.D.
 John D. Baker, M.D.
 John B. Bilezikian, M.D.
 David K. Blood, M.D.
 F. James Brennan, M.D.
 Jeffrey M. Brensilver, M.D.
 Michael A. Bush, M.D.
 Arthur Chernoff, M.D.
 Paul J. Chrzanowski, M.D.
 Ann P. D'Adamo, M.D.
 Leland G. Dobbs, M.D.
 Leon H. Dragon, M.D.

† Inactive

* Leave of Absence

Robert J. Dresdale, M.D.
 Arthur E. Feinerman, M.D.
 Paul A. Friedman, M.D.
 Thomas J. Garrett, M.D.
 Edward R. George, M.D.
 Stephen J. Gunther, M.D.
 Wesley P. Hager, M.D.
 Scott M. Hammer, M.D.
 Peter Hasselbacher, M.D.
 John P. Hoche, M.D.
 Thomas P. Jacobs, M.D.
 Lynne Johnson, M.D.
 Burton Mayrowetz, M.D.
 John S. McDougal, M.D.
 Gilbert H. Mudge, Jr., M.D.
 John H. Newman, M.D.
 Stephen J. Pancoast, M.D.
 Martin Paris, M.D.
 Phillip K. Peterson, M.D.
 Michael Pine, M.D.
 Caroline Riely, M.D.
 Benjamin M. Romney, M.D.
 Sara G. Rosenthal, M.D.
 Elaine B. Sadler, M.D.
 Robert A. Schulze, Jr., M.D.
 Alan H. Seplowitz, M.D.
 Jane S. Sillman, M.D.
 Carol D. Silver, M.D.
 Alfred Singer, M.D.
 Ethel S. Siris, M.D.
 Richard E. Thorner, M.D.
 Joseph M. Vinci, M.D.
 Ronald Wallach, M.D.
 Francis M. Weld, M.D.
 Joseph M. Wildman, M.D.
 Thomas M. Woodcock, M.D.

INTERNS

J. Barclay Adams, M.D.
 Stephen A. Bernard, M.D.
 Catherine F. Cabot, M.D.
 Robert H. Carlson, M.D.
 Philip Cohen, M.D.
 Edward V. Craig, M.D.
 Jurrien Dean, M.D.
 Betty A. Diamond, M.D.
 Stuart F. Finkel, M.D.
 Mark J. Goldberger, M.D.
 Garner T. Haupt, M.D.
 Katherine A. Hawkins, M.D.
 Rudiger Hehlman, M.D.
 Bruce E. Kessler, M.D.
 Edward J. Kosinski, M.D.
 Lee M. Nadler, M.D.
 Jerry Nagler, M.D.
 Jeffrey Pines, M.D.
 Stanley Rosenbaum, M.D.
 Hermon Saunders, M.D.
 Michael Savona, M.D.
 David B. Sutter, M.D.
 Alan C. Swann, M.D.
 Allen S. Weiss, M.D.

VISITING FELLOWS

Tayyiba Awan, M.D.

William G. Baxt, M.D.
 Sophie B. Bilezikian, M.D.
 Charles E. Blair, M.D.
 Hans R. Brunner, M.D.
 Fritz R. Buhler, M.D.
 Robert W. Bunting, M.D.
 Patrick Campbell, M.D.
 Paul Dalgin, M.D.
 Roy Fleischman, M.D.
 Glenda J. Garvey, M.D.
 Haralambos P. Gavras, M.D.
 Irene Gavras, M.D.
 Harold German, M.D.
 Matthew J. Guy, M.D.
 Joanna Haas, M.D.
 Reinhard G. Herz, M.D.
 Musa Kazin Husain, M.D.
 Hans-Jorg Keim, M.D.
 Hyo Chul Kim, M.D.
 Marc H. Lavietes, M.D.
 Joseph S. Levy, M.D.
 Jorge Lopez-Ovejero, M.D.
 George Mallis, M.D.
 John E. McWhorter, M.D.
 Carlos E. Menendez, M.D.
 Ghulam D. Quereshi, M.D.
 Bernadette Rafferstein, M.D.
 Lawrence M. Resnick, M.D.
 Robert J. Reza, M.D.
 Jose Rodriguez, M.D.
 Han Kyu Suh, M.D.
 Herbert Thurston, M.D.
 E. Darracott Vaughan, Jr., M.D.
 Luis F. Villamon, M.D.
 Peter Weidinger, M.D.
 Ian M. Yudelman, M.D.

Microbiology

MICROBIOLOGISTS

Paul D. Ellner, PH.D.
 Elvin A. Kabat, PH.D.

ASSOCIATE ATTENDING MICROBIOLOGIST
 Councilman Morgan, M.D.

Neurological Surgery Service (Neurological Institute)

DIRECTOR OF SERVICE

Edward B. Schlesinger, M.D.

ATTENDING NEUROLOGICAL SURGEONS
 James W. Correll, M.D.
 Lester A. Mount, M.D.

ASSOCIATE ATTENDING NEUROLOGICAL
 SURGEONS

Thomas J. Bridges, Jr., M.D.
 Edgar M. Housepian, M.D.
 James G. McMurtry, III, M.D.

ASSISTANT ATTENDING NEUROLOGICAL
 SURGEONS

Peter W. Carmel, M.D.
 W. Jost Michelsen, M.D.

ASSISTANT NEUROLOGICAL SURGEONS

Ronald Brisman, M.D.
 James E. Finn, M.D.

RESIDENTS

Howard H. Kaufman, M.D.
 Timothy B. Scarff, M.D.

ASSISTANT RESIDENTS

Joao L. Antunes, M.D.
 Eugene A. Balis, M.D.
 Martin B. Camins, M.D.
 Roger W. Countee, M.D.
 Robert B. Holtzman, M.D.
 Richard D. Penn, M.D.
 Philip Peter, M.D.
 Donald Quest, M.D.
 Michael Salcman, M.D.
 Nicholas Szabo, M.D.

Neurology Service

(Neurological Institute)

DIRECTOR OF SERVICE

Lewis P. Rowland, M.D.

ATTENDING NEUROLOGISTS

Sidney Carter, M.D.
 Roger C. Duvoisin, M.D.
 Stanley Fahn, M.D.
 Sid Gilman, M.D.
 Eli S. Goldensohn, M.D.
 *Donald H. Harter, M.D.
 Richard L. Masland, M.D.
 †John McD. McKinney, M.D.
 Daniel Sciarra, M.D.
 Carmine T. Vicale, M.D.
 *Melvin D. Yahr, M.D.

ASSOCIATE ATTENDING NEUROLOGISTS

Joseph G. Chusid, M.D.
 Abe M. Chutorian, M.D.
 Lucien J. Cote, M.D.
 Robert A. deNapoli, M.D.
 †Stanley M. Dillenberg, M.D.
 †Alfred Gallinek, M.D.
 Arnold P. Gold, M.D.
 James F. Hammill, M.D.
 Stanley Lesse, M.D.
 Robert E. Lovelace, M.D.
 Niels L. Low, M.D.
 †Joseph Moldaver, M.D.
 Joseph L. O'Brien, M.D.
 Audrey S. Penn, M.D.
 †Samuel Reback, M.D.
 Ralph W. Richter, M.D.
 Margaret R. Seiden, M.D.
 †Maximilian Silbermann, M.D.
 Samuel F. Thomas, M.D.
 Hyman G. Weitzen, M.D.

† Inactive
 * Leave of Absence

ASSISTANT ATTENDING NEUROLOGISTS

Robert E. Barrett, M.D.
 Frank K. Boschenstein, M.D.
 Carl W. Braun, M.D.
 Jason W. Brown, M.D.
 John C. M. Brust, Jr., M.D.
 Malcolm B. Carpenter, M.D.
 Sidney M. Cohen, M.D.
 James F. Culleton, M.D.
 Richard F. Defendini, M.D.
 William P. Isgreen, M.D.
 M. Richard Koenigsberger, M.D.
 †Raul Pietri, M.D.
 David L. Sagman, M.D.
 Earl A. Zimmerman, M.D.

ASSISTANT NEUROLOGISTS

Alfred C. Bannerman, M.D.
 V. John Blazina, M.D.
 Martha B. Denckla, M.D.
 Sarala A. Devi, M.D.
 Robert A. Esser, M.D.
 Eugenia Gamboa, M.D.
 Edward J. Hart, M.D.
 Donald R. Hirsch, M.D.
 Stanley B. Holstein, M.D.
 Linda D. Lewis, M.D.
 Geoffrey F. Osler, M.D.
 Sang C. Rhee, M.D.
 Michael L. Sananman, M.D.
 Dora H. Schivily, M.D.

RESIDENT

Michael Margolin, M.D.

ASSISTANT RESIDENTS

David J. Adams, M.D.
 Adam Bender, M.D.
 Richard A. Berenberg, M.D.
 Arthur S. Brown, M.D.
 Louis W. Catalano, M.D.
 Jonathan Charney, M.D.
 Pamela Chavis, M.D.
 William P. Duggan, M.D.
 Michael L. Gruber, M.D.
 Fernando Herrero, M.D.
 Kenneth G. Jordan, M.D.
 Stephen C. Klass, M.D.
 Stuart Mallinoff, M.D.
 Alan Pertchik, M.D.
 Howard B. Reiser, M.D.
 David Rosenbaum, M.D.
 Allan Rubenstein, M.D.
 Marc Rubenstein, M.D.
 David P. Saur, M.D.
 Richard Schoenfeldt, M.D.
 Paul J. Silbert, M.D.

VISITING FELLOWS

Laurence Carnay, M.D.
 Patricia Crumrine, M.D.
 Jocelyn Dougherty, M.D.
 Frances M. Dyro, M.D.
 Leonardo Garcia, M.D.
 Edward B. Healton, M.D.

Burk Jubelt, M.D.

Mary Elizabeth Lell, M.D.
 Theodore A. List, M.D.
 Renee Malouf, M.D.
 Michael Newmark, M.D.
 Michael Painter, M.D.
 John Pellock, M.D.
 David A. Rothner, M.D.
 Stephen Sachs, M.D.
 Hector B. Santana, M.D.
 Carmela Tardo, M.D.
 Leon Weisberg, M.D.
 Frank R. Wilson, M.D.

Obstetrics and Gynecology Service

(Sloane Hospital for Women)

DIRECTOR OF SERVICE

Raymond L. Vande Wiele, M.D.

ATTENDING OBSTETRICIANS AND GYNECOLOGISTS

†Stanley M. Bysshe, M.D.
 Henry Clay Frick, II, M.D.
 Georgiana Jagiello, M.D.
 Orlando J. Miller, M.D.
 Equinn W. Munnell, M.D.
 Robert S. Neuwirth, M.D.
 †C. Paul O'Connell, M.D.
 Charles M. Steer, M.D.

ASSOCIATE ATTENDING OBSTETRICIANS AND GYNECOLOGISTS

Vincent J. Freda, M.D.
 *Robert E. Hall, M.D.
 David B. Moore, M.D.
 W. Duane Todd, M.D.
 Gilbert J. Vosburgh, M.D.
 Susan W. Williamson, M.D.

ASSISTANT ATTENDING OBSTETRICIANS AND GYNECOLOGISTS

Edward T. Bowe, M.D.
 Solan Chao, M.D.
 Dean J. Grandin, M.D.
 Raphael Jewelewicz, M.D.
 Raymond M. McCaffrey, M.D.
 Roy H. Petrie, M.D.
 Anne B. Pierson, M.D.
 Meredith Sirmans, M.D.
 Harold Speert, M.D.
 Wolfgang Tretter, M.D.

ASSISTANT OBSTETRICIANS AND GYNECOLOGISTS

Hussein K. Amin, M.D.
 Ming-Neng Yeh, M.D.

ASSISTANT GYNECOLOGIST

†Thomas J. Parks, M.D.

RESIDENTS

Joseph V. Battista, M.D.
 Jerome L. Belinson, M.D.
 John E. Gaines, M.D.
 Achim Heintze, M.D.
 Arthur C. Pollack, M.D.
 Anthony G. Santomauro, M.D.
 Kenneth Weissman, M.D.

ASSISTANT RESIDENTS

Jeanette E. Akhter, M.D.
 Gregoire Barrette, M.D.
 Richard H. Blum, M.D.
 Richard R. Bowie, M.D.
 Stewart Brazin, M.D.
 Leopoldo Cardenas, M.D.
 William B. Carey, M.D.
 Charles S. Hawa, M.D.
 Olga Kokic, M.D.
 Roger B. Lenke, M.D.
 Chin-Chu Lin, M.D.
 Donald R. Mattison, M.D.
 Wayne A. Miller, M.D.
 Eberhard A. Mueller-Heubach, M.D.
 Kevin B. Reilly, M.D.
 G. Paul Savidge, M.D.
 Olive Soriero, M.D.
 Edgardo L. Yordan, Jr., M.D.

VISITING FELLOWS

Roy P. Ans, M.D.
 Milagros Benedito, M.D.
 Ernesto Bosch, M.D.
 Steve N. Caritas, M.D.
 Sahail Khalaf, M.D.

Ophthalmology Service

(The Edward S. Harkness Eye Institute)

DIRECTOR OF SERVICE

Arthur Gerard DeVoe, M.D.

ATTENDING OPHTHALMOLOGISTS

Charles J. Campbell, M.D.
 Robert McC. Day, M.D.
 Ira Snow Jones, M.D.
 Philip Knapp, M.D.
 George R. Merriam, Jr., M.D.

ASSOCIATE ATTENDING OPHTHALMOLOGISTS

†Frank D. Carroll, M.D.
 †J. Vincent Flack, M.D.

ASSISTANT ATTENDING OPHTHALMOLOGISTS

William C. Cooper, M.D.
 Andrew deRoeth, Jr., M.D.
 Anthony Donn, M.D.
 Robert M. Ellsworth, M.D.
 John W. Espy, M.D.
 Max Forbes, M.D.

* Leave of Absence

† Inactive

ASSISTANT ATTENDING OPHTHALMOLOGISTS (continued)

Arnold W. Forrest, M.D.
George M. Howard, M.D.
Francis A. L'Esperance, Jr., M.D.
Ellen F. Regan, M.D.
Harold F. Spalter, M.D.

ASSOCIATE OPHTHALMOLOGISTS

D. Jackson Coleman, M.D.
Richard W. Darrell, M.D.
R. Linsy Farris, M.D.
Frank B. Hoefle, M.D.
Stephen L. Trokel, M.D.
Emil Wirostko, M.D.

ASSISTANT OPHTHALMOLOGISTS

Richard D. Banyard, M.D.
Myles M. Behrens, M.D.
Milton F. Campbell, M.D.
William A. James, Jr., M.D.
Richard G. Lennon, M.D.
Hugh MacMillan Moss, M.D.
Balachandran D. Srinivasan, M.D.
Thaddeus L. Wandel, M.D.

RESIDENTS

Frank C. Bell, M.D.
David H. Brown, M.D.
Douglas F. Greer, M.D.

ASSISTANT RESIDENTS

David H. Abramson, M.D.
Craig Edmonds, M.D.
Howard Eggers, M.D.
Donald H. Green, M.D.
Walter W. Merriam, M.D.
Lawrence G. Pape, M.D.
Guillermo Pico, Jr., M.D.
Jesse Sigelman, M.D.
Geoffrey G. White, M.D.

VISITING FELLOWS

David G. Harper, M.D.
Albert J. Hofeldt, M.D.
Bart T. Ketover, M.D.
John C. Stuart, M.D.

Orthopedic Surgery Service (New York Orthopedic Hospital)

DIRECTOR OF SERVICE

Frank E. Stinchfield, M.D.

ATTENDING SURGEONS

George B. Ambrose, M.D.
David L. Andrews, M.D.
C. Andrew L. Bassett, M.D.
Everett C. Bragg, M.D.
Robert E. Carroll, M.D.
Alexander Garcia, M.D.
Sawnie R. Gaston, M.D.
S. Ashby Grantham, M.D.

†Halford Hallock, M.D.

†Leonidas A. Lantzounis, M.D.

Charles S. Neer, II, M.D.
Charles T. Ryder, M.D.

ASSOCIATE ATTENDING SURGEONS

D. Keith McElroy, M.D.
†Melvin B. Watkins, M.D.

ASSISTANT ATTENDING SURGEONS

Harold M. Dick, M.D.
Nas E. Eftekhari, M.D.
Alice L. Garrett, M.D.
Rosamond Kane, M.D.
Merle H. Katzman, M.D.
Hugo A. Keim, M.D.
Peter LaMotte, M.D.
James C. Parkes, II, M.D.
Andrew H. Patterson, M.D.
Robert M. Reiss, M.D.
Martin L. Sorger, M.D.

ASSISTANT SURGEONS

Peter N. Carbonara, M.D.
William U. Cavallaro, M.D.
Chauncey H. Dobson, M.D.
Richard L. Fenton, M.D.
William G. Hamilton, M.D.
Abraham C. Kovarsky, M.D.
Harvey Orlin, M.D.
Marvin L. Shelton, M.D.
William A. Sinton, M.D.
Lars A. Skilbred, M.D.
David M. Smith, M.D.
Joel D. Weinstein, M.D.
Eric K. Zitzmann, M.D.

SENIOR ANNIE C. KANE FELLOWS

John F. Adams, Jr., M.D.
John R. Denton, M.D.
Howard A. Kiernan, M.D.

JUNIOR ANNIE C. KANE FELLOWS

William B. Bowers, M.D.
William R. Rennie, M.D.

JUNIOR ANNIE C. KANE FELLOWS & RESIDENTS

John H. Buckner, M.D.
A. Roy Buerkle, M.D.
David C. Bush, M.D.
Robert N. Dunn, M.D.
John R. Freeman, M.D.
Mark O. Gladstein, M.D.
Andrew K. Greene, M.D.
Gary C. Hassman, M.D.
Lawrence Katz, M.D.
Raphael K. Levine, M.D.
Christopher B. Michelsen, M.D.
Barton Nisonson, M.D.
James B. Wessinger, M.D.
Russell R. Zelko, M.D.

ASSISTANT RESIDENTS

John H. Bargren, M.D.
Charles B. Brown, Jr., M.D.
Frederick M. Brunn, Jr., M.D.
Michael P. Coyle, M.D.

Steven M. Erlanger, M.D.
Robert W. Gause, M.D.
Thomas P. Goss, M.D.
Charles V. Helming, M.D.
Joseph E. Imbriglia, M.D.
Marc I. Malberg, M.D.
Thomas R. Norris, M.D.
Walter J. Pedowitz, M.D.
Jeffrey F. Rubin, M.D.
Hervey Sicherman, M.D.
Lawrence D. Weis, M.D.
Richard L. Worlund, M.D.

VISITING FELLOW

Charles D. Nach, M.D.

Otolaryngology Service

DIRECTOR OF SERVICE

Daniel C. Baker, Jr., M.D.

ATTENDING OTOLARYNGOLOGISTS

Milos Bask, M.D.
John J. Conley, M.D.
Robert M. Hui, M.D.
Jules G. Waltner, M.D.

ASSOCIATE ATTENDING OTOLARYNGOLOGISTS

Robin M. Rankow, M.D., D.D.S.
Malcolm H. Schvey, M.D.

ASSISTANT ATTENDING OTOLARYNGOLOGISTS

†Edwin B. Bilchick, M.D.
Raymond M. Cole, M.D.
Robert C. Eberle, M.D.
Olaf Haroldson, Jr., M.D.
†Bela Marquit, M.D.
Frank V. Mignogna, M.D.
Lawrence Savetsky, M.D.

ASSISTANT OTOLARYNGOLOGISTS

Neville W. Carmical, M.D.
Claudio Crupi, M.D.
Ivo P. Janecka, M.D.
John Palesty, M.D.
Raymond B. Strauss, M.D.
Peter D. Westerhoff, Jr., M.D.
Howard D. Zipper, M.D.

RESIDENTS

Eugene P. Falk, M.D.
Marc C. Karlan, M.D.
Ronald B. Lorenc, M.D.
Catherine A. Marley, M.D.

ASSISTANT RESIDENTS

James Z. Cinberg, M.D.
Ned M. DiPasquale, M.D.
Frederick Fiber, M.D.
Jeffrey D. Fleigel, M.D.
Richard S. Mega, M.D.
Lawrence J. Pizzo, M.D.
Jacob Z. Slepian, M.D.

Pathology Service**DIRECTOR OF SERVICE**

Donald W. King, M.D.

ATTENDING NEUROPATHOLOGIST

Philip Duffy, M.D.

ATTENDING SURGICAL PATHOLOGISTSNathan Lane, M.D.
Raffaele Lattes, M.D.**ATTENDING PATHOLOGISTS**William A. Blanc, M.D.
Arthur W. Branwood, M.D.
S. Raymond Gambino, M.D.
Gabriel C. Godman, M.D.
John G. Gorman, M.D.
Conrad L. Pirani, M.D.
Ralph M. Richart, M.D.**ASSOCIATE ATTENDING
ORTHOPEDIC PATHOLOGISTS**†C. Zent Garber, M.D.
Austin D. Johnston, M.D.**ASSOCIATE ATTENDING
SURGICAL PATHOLOGISTS**Karl H. Perzin, M.D.
Marianne Wolff, M.D.**ASSOCIATE ATTENDING PATHOLOGISTS**Jack W. C. Hagstrom, M.D.
Myron Tannenbaum, M.D.
H. Joachim Wigger, M.D.**ASSISTANT ATTENDING PEDIATRIC
PATHOLOGIST**

Thomas A. Blumenfeld, M.D.

ASSISTANT ATTENDING PATHOLOGISTSKenneth F. Button, M.D.
*John J. Fenoglio, Jr., M.D.
Joshua A. Fierer, M.D.
Lewis A. Johnson, M.D.
Robert Pascal, M.D.**RESIDENTS**Teisa An, M.D.
Marie-Jeanne Castadot, M.D.
Roger Derosena, M.D.
Jared J. Gardner, M.D.
Albert Greenwood, M.D.
Arthur P. Hays, M.D.
Joan Howanitz, M.D.
Frederick A. Jakobiec, M.D.
Paul A. Krieger, M.D.
Chairat Kulsakdinum, M.D.
Clark Lambert, M.D.
Gifford Y. Lum, M.D.
Anthony Marchand, M.D.
Ricardo Mesa-Tejada, M.D.
Frida Parker, M.D.
Fred G. Silva, M.D.
Albert Stanek, M.D.Robert A. Strauss, M.D.
Lynn J. Yaffee, M.D.**INTERNS**Philip Altman, M.D.
Daniel Knowles, M.D.
Anne-Marie Weber, M.D.**VISITING FELLOWS**John P. Caulfield, M.D.
Thomas M. Fasy, M.D.
Cecilia Fenoglio, M.D.
Robert S. Galen, M.D.
Hyun J. Jung, M.D.
Ronald C. Kim, M.D.
Virginia LiVolsi, M.D.
Kokila Mody, M.D.
Joel Roth, M.D.
Jane Simon, M.D.
Kurt Stromberg, M.D.
William O. Whetsell, M.D.**Pediatric Service**

(Babies Hospital)

DIRECTOR OF SERVICE

Richard E. Behrman, M.D.

ATTENDING PEDIATRICIANSLouis Z. Cooper, M.D.
Edward C. Curnen, Jr., M.D.
L. Stanley James, M.D.
Erich J. Kahn, M.D.
Michael Katz, M.D.
George I. Lythcott, M.D.
Stuart S. Stevenson, M.D.
Myron Winick, M.D.
Robert W. Winters, M.D.
James A. Wolff, M.D.**ASSOCIATE ATTENDING PEDIATRICIANS**†Harry S. Altman, M.D.
William A. Bauman, M.D.
Jo Anne Brasel, M.D.
†John M. Brush, M.D.
Solomon J. Cohen, M.D.
Douglas S. Damrosch, M.D.
Ralph B. Dell, M.D.
Carolyn R. Denning, M.D.
Welton M. Gersony, M.D.
Susan G. Gordon, M.D.
Sylvia P. Griffiths, M.D.
Ruth C. Harris, M.D.
†J. Taylor Howell, M.D.
Jerry C. Jacobs, M.D.
Chris. P. Katsampes, M.D.
Walter R. Kessler, M.D.
Wiener Leblanc, M.D.
Gilbert W. Mellin, M.D.
Robert B. Mellins, M.D.
†Katharine K. Merritt, M.D.
Akira Morishima, M.D.John F. Nicholson, M.D.
Katherine Sprunt, M.D.**ASSISTANT ATTENDING PEDIATRICIANS**Cyril A. L. Abrams, M.D.
Rose G. Ames, M.D.
Robert E. Appleby, M.D.
Russell S. Asnes, M.D.
Jennifer J. Bell, M.D.
Alexander Blum, Jr., M.D.
Joseph M. Bordiuk, M.D.
William J. Davis, M.D.
Catherine DeAngelis, M.D.
Elinor F. Downs, M.D.
John M. Driscoll, Jr., M.D.
Yvonne T. Driscoll, M.D.
Burton M. Feinsmith, M.D.
Bernard R. Feldman, M.D.
Judith E. Frank, M.D.
David N. Franklin, M.D.
Pureza F. M. Gaerlan, M.D.
Marguerite J. Gates, M.D.
Gustave Gavis, M.D.
Thurman B. Givan, Jr., M.D.
Stephen Glaser, M.D.
Doris K. E. Goldberg, M.D.
I. Bruce Gordon, M.D.
Burton Grebin, M.D.
Bertram M. Grossman, M.D.
Constance J. Hayes, M.D.
William C. Heird, M.D.
John J. Kangos, M.D.
Eugene L. Klenk, M.D.
Ehud Krongrad, M.D.
Hunter C. Leake, III, M.D.
Martin I. Lorin, M.D.
Dean N. Martin, M.D.
Armond V. Mascia, M.D.
Anthony B. Minnefor, M.D.
Celia Ores, M.D.
Thomas W. Patrick, M.D.
Jane Pitt, M.D.
Margaret M. Rice, M.D.
Roderick C. Richards, M.D.
John S. Rosmaita, M.D.
David Rush, M.D.
Narayan R. Shah, M.D.
Jack G. Shiller, M.D.
Joseph A. Silverman, M.D.
Gilbert Simon, M.D.
Anneliese L. Sitarz, M.D.
William H. Smith, M.D.
Carl N. Steeg, M.D.
Lucy H. Swift, M.D.
Elizabeth Ufford, M.D.
Martin B. Vita, M.D.
†Frederick H. von Hofe, M.D.
Elizabeth B. Watkins, M.D.
Doris L. Wethers, M.D.
Leo F. J. Wilking, M.D.
†Agnes G. Wilson, M.D.
Philip R. Ziring, M.D.
Preston L. Zucker, M.D.

† Inactive

• Leave of Absence

ASSOCIATE PEDIATRICIANS

Mary E. Bradford, M.D.
 Jane A. Erganian, M.D.
 Louis Rodriguez, M.D.
 Elizabeth F. Turnauer, M.D.
 William W. Whitten, M.D.

ASSISTANT PEDIATRICIANS

Renee J. Abt, M.D.
 †Mary Adams, M.D.
 Dennis J. Allendorf, M.D.
 Martha L. Amarant, M.D.
 Albert J. Beckmann, M.D.
 Alma T. Blitz, M.D.
 Matilda B. Brust, M.D.
 Roger Challop, M.D.
 Solomon Chazan, M.D.
 John L. Costa, M.D.
 Ruth U. Donovan, M.D.
 T. Donald Eisenstein, M.D.
 Elizabeth G. Estrin, M.D.
 Bernard Etra, M.D.
 Matthew Feldman, M.D.
 †Lavinia G. M. Fox, M.D.
 Robert A. Herzlinger, M.D.
 Alan Hordof, M.D.
 Norman S. Katz, M.D.
 Betty Chi Mei Lee Kuo, M.D.
 Michael L. Lapkin, M.D.
 Carolkay Lissenden, M.D.
 Joan W. Mathews, M.D.
 Shirley A. Mayer, M.D.
 †George W. McCormick, M.D.
 Margaret McHugh, M.D.
 Daniel J. Melia, M.D.
 †Kenneth M. Metcalf, M.D.
 Walter L. Mitchell, Jr., M.D.
 Stanley G. Morrison, M.D.
 Ruth D. Peters, M.D.
 Herbert E. Poch, M.D.
 Morton H. Rachelson, M.D.
 Geoffrey P. Redmond, M.D.
 Mary R. Richards, M.D.
 Albert P. Rosen, M.D.
 Rosalinda Rubinsztain, M.D.
 Gloria O. Schrager, M.D.
 Morton J. Seligman, M.D.
 Sheila A. Shanahan, M.D.
 Pradeep Sharma, M.D.
 Edith M. J. Shen, M.D.
 Kung-Tso Sheng, M.D.
 Walter R. Stankewick, M.D.
 David Stiles, M.D.
 Robert C. Wheeler, M.D.
 †Daniel A. Wilcox, M.D.

RESIDENTS

Thomas L. Anderson, M.D.
 Mary Ann J. Colenda, M.D.
 Nora J. Klein, M.D.
 Steve Kohl, M.D.
 George M. Lazarus, M.D.
 Ramon J. Murphy, M.D.
 D. Loren Southern, M.D.
 Mary B. Tierney, M.D.

ASSISTANT RESIDENTS

Dennis Allendorf, M.D.
 Michael B. Andorsky, M.D.
 Robert Antar, M.D.
 Robert A. Boxer, M.D.
 Janna C. Collins, M.D.
 Douglas A. Dransfield, M.D.
 Susan S. Dresdale, M.D.
 Douglas C. Henry, M.D.
 Peter Lang, M.D.
 Evelyn Lipper, M.D.
 Richard L. Mones, M.D.
 James G. Nealis, M.D.
 Martha M. Provine, M.D.
 Geoffrey P. Redmond, M.D.
 Harriet A. Siegel, M.D.
 Elda H. Simpson, M.D.

INTERNS

Edward F. Bell, M.D.
 Susan B. Carlson, M.D.
 Patricia M. Hicks, M.D.
 Raymond A. Kahn, M.D.
 Christine A. Kull, M.D.
 David Z. Myerberg, M.D.
 Joseph C. Napoli, M.D.
 Emi Okamoto, M.D.
 Pail A. Palma, M.D.
 Adelisa Panlilio, M.D.
 Julius Sherwinter, M.D.
 Edward Tabor, M.D.
 John R. Wittenborn, M.D.

VISITING FELLOWS

Hans J. Bohles, M.D.
 William J. Chernak, M.D.
 Duane W. Ebaugh, M.D.
 William R. Griswold, M.D.
 Stephen Hefler, M.D.
 Robert A. Herzlinger, M.D.
 Laura Inselman, M.D.
 Michael Koss, M.D.
 Lorenzo Lavorgna, M.D.
 Chuck-Kwan K. Lee, M.D.
 Sajid Maqbool, M.D.
 Enrique Massa, M.D.
 Margaret McHugh, M.D.
 Werner Meier, M.D.
 Mona Milstein, M.D.
 James Nettleton, M.D.
 Sungmin Park, M.D.
 Richard Polin, M.D.
 Frank Rodriguez-Martinez, M.D.
 Tove Rosen, M.D.
 Narayan R. Shah, M.D.
 Yong H. Shin, M.D.
 William Speck, M.D.
 Raymond Stark, M.D.
 Nestor Truccone, M.D.

Pharmacology

PHARMACOLOGIST

Brian F. Hoffman, M.D.

Psychiatry Service

DIRECTOR OF SERVICE

Lawrence C. Kolb, M.D.

ATTENDING PSYCHIATRISTS

Arnold M. Cooper, M.D.
 Elizabeth B. Davis, M.D.
 §Harlow D. Dunton, M.D.
 Archie R. Foley, M.D.
 Lothar Gidro-Frank, M.D.
 Murray Glusman, M.D.
 §William Goldfarb, M.D.
 Ernest M. Gruenberg, M.D.
 Jerome H. Jaffe, M.D.
 †George A. Jervis, M.D.
 Aaron Karush, M.D.
 Otto Friedmann Kernberg, M.D.
 Donald S. Kornfeld, M.D.
 Roger MacKinnon, M.D.
 Sidney Malitz, M.D.
 Bernard L. Pacella, M.D.
 John D. Rainer, M.D.

ASSOCIATE ATTENDING PSYCHIATRISTS

Kenneth Z. Altschuler, M.D.
 James P. Cattell, M.D.
 John W. Cederquist, M.D.
 John A. Cook, M.D.
 Ronald R. Fieve, M.D.
 Alexander H. Glassman, M.D.
 Marvin I. Herz, M.D.
 §John P. Lambert, M.D.
 Joseph M. Lubart, M.D.
 Robert Michels, M.D.
 John F. O'Connor, M.D.
 James H. Ryan, M.D.
 Bernard B. Schoenberg, M.D.
 Herbert Spiegel, M.D.

ASSISTANT ATTENDING PSYCHIATRISTS

Arthur N. Avella, M.D.
 Andre B. Ballard, M.D.
 †Benjamin H. Balser, M.D.
 Leah Beck, M.D.
 Jules R. Bemporad, M.D.
 Levon Z. Boyajian, M.D.
 DeWitt L. Crandell, M.D.
 Zira DeFries, M.D.
 Richard G. Druss, M.D.
 David L. Dunner, M.D.
 §Olga Frankel, M.D.
 Richard A. Gardner, M.D.
 Myron R. Gershberg, M.D.
 §Rodman Gilder, Jr., M.D.
 Victor Goldin, M.D.
 Jerome D. Goodman, M.D.
 §Sol L. Goodman, M.D.
 †Werner Hochstetter, M.D.
 Winslow R. Hunt, M.D.
 David Jaffe, M.D.
 Clarice J. Kestenbaum, M.D.
 §Peter Laderman, M.D.
 Norman D. Lazar, M.D.
 Alexander N. Levay, M.D.

† Inactive

§ Pediatric Psychiatry

ASSISTANT ATTENDING PSYCHIATRISTS
(continued)

Florence G. Liben, M.D.
 Robert S. Liebert, M.D.
 Mary C. MacKay, M.D.
 Helen C. Meyers, M.D.
 †John A. P. Millet, M.D.
 Robert S. Mumford, M.D.
 Winfred Overholser, Jr., M.D.
 §Robert P. Parkin, M.D.
 David Peretz, M.D.
 Alvin H. Polatin, M.D.
 Seymour C. Post, M.D.
 Harry R. Potter, M.D.
 §Kathryn F. Prescott, M.D.
 †Alfred Schick, M.D.
 Jesse L. Schomer, M.D.
 Lilli C. Shalsha, M.D.
 Kendon W. Smith, M.D.
 John A. Sours, M.D.
 Daniel N. Stern, M.D.
 Milton Viederman, M.D.
 Josef H. Weissberg, M.D.
 §Exie E. Welsch, M.D.
 Ralph N. Wharton, M.D.
 George H. Wilkie, M.D.

ASSOCIATE PSYCHIATRISTS

Burton August, M.D.
 Athanasia Balkoura, M.D.
 §Stephen L. Bennett, M.D.
 §John P. Briggs, M.D.
 Paul F. Califano, M.D.
 A. David Etes, M.D.
 Eugene S. Forster, M.D.
 Eugene A. Friedberg, M.D.
 Lee R. Gardner, M.D.
 §Louis J. Gilbert, M.D.
 Alvin J. Glick, M.D.
 Ivan K. Goldberg, M.D.
 Gurston Goldin, M.D.
 Fiona Graham, M.D.
 Kenneth Greenspan, M.D.
 Lloyd A. Hamilton, Jr., M.D.
 Sidney B. Heimbach, M.D.
 Stanley S. Heller, M.D.
 Morton M. Hodas, M.D.
 Clifton M. Howard, M.D.
 Daniel Justman, M.D.
 Gabriel V. Laury, M.D.
 Leon Lefer, M.D.
 Naomi Leiter, M.D.
 Burton A. Lerner, M.D.
 Stephan J. Levitan, M.D.
 Stanley Lituchy, M.D.
 Virginia Lozzi, M.D.
 Neil M. MacLean, M.D.
 Eugene M. Martin, M.D.
 Philip Mertz, M.D.
 Leonard M. Moss, M.D.
 John F. Oliven, M.D.
 E. Rea Paidoussi, M.D.
 Samuel W. Perry, III, M.D.
 Stephen P. Reibel, M.D.

Terry C. Rodgers, M.D.
 John W. Rosenberger, M.D.
 Nicholas Samios, M.D.
 George Satran, M.D.
 Charles Siegal, M.D.
 Arthur H. Stein, M.D.
 Sanford Stein, M.D.
 Jerome Steiner, M.D.
 Michael H. Stone, M.D.
 Ruth Szmara, M.D.
 Phillip Zeidenberg, M.D.

ASSISTANT PSYCHIATRISTS

Harry Albert, M.D.
 Michael S. Aronoff, M.D.
 John A. Atchley, M.D.
 Donald C. Bell, M.D.
 Robinette N. Bell, M.D.
 Raymond Bernick, M.D.
 Anne E. Bernstein, M.D.
 Charles Carluccio, Jr., M.D.
 Leon Chattah, M.D.
 Harvey R. Chertoff, M.D.
 Irene Chiarandini, M.D.
 Stanley J. Coen, M.D.
 Dennis Dalton, M.D.
 Ellen M. Dolganos, M.D.
 James Egan, M.D.
 Harold B. Esecover, M.D.
 Aristede H. Esser, M.D.
 Jerry B. Finkel, M.D.
 Bruce M. Forester, M.D.
 Richard C. Friedman, M.D.
 William W. Garitano, M.D.
 Robert A. Glick, M.D.
 Maurice Golbey, M.D.
 Joel S. Hoffman, M.D.
 Sonia W. Hyman, M.D.
 Carlos I. Ifarraguerri, M.D.
 David Iverson, M.D.
 Lila J. Kalinich, M.D.
 Shepard J. Kantor, M.D.
 James G. Katis, M.D.
 Neil B. Kavey, M.D.
 Ann G. Keill, M.D.
 †Samuel Lowy, M.D.
 George W. Luhrmann, Jr., M.D.
 Michael R. Milano, M.D.
 William J. Nemon, M.D.
 John D. O'Brien, M.D.
 Phyllis B. Robbins, M.D.
 Barbara R. Rosenfeld, M.D.
 Arnold M. Rothstein, M.D.
 M. Bruce Sarlin, M.D.
 Arthur H. Schore, M.D.
 Michael Shostak, M.D.
 Eleanor S. Schuker, M.D.
 Irene B. Seeland, M.D.
 Edward M. Shelley, M.D.
 Frieda H. Spady, M.D.
 Henry I. Spitz, M.D.
 Rishon Stember, M.D.
 Alfonso Tornusciolo, M.D.

RESIDENTS

Steven Buchanan, M.D.
 Michael Chojnacki, M.D.
 Daniel E. Cohen, M.D.
 Richard Cowan, M.D.
 Francine Cournos, M.D.
 John F. Crow, M.D.
 Peter B. Davol, M.D.
 Walter A. Dietzgen, M.D.
 Linda Feinfeld, M.D.
 Ira D. Feirstein, M.D.
 Jed Goldart, M.D.
 Eugene Goldwater, M.D.
 Michael J. Goran, M.D.
 James Gordon, M.D.
 Ronald A. Grant, M.D.
 Howard Gross, M.D.
 William B. Head, M.D.
 Terry W. Hugg, M.D.
 Lila Kalinich, M.D.
 Betty Karron, M.D.
 Enid Lang, M.D.
 Ronald P. Lessar, M.D.
 Diane Lipson, M.D.
 Erica Loutsch, M.D.
 Mark R. Mankoff, M.D.
 Eric Marcus, M.D.
 Peter C. Martindale, M.D.
 Reed C. Moskowitz, M.D.
 Keith M. Muir, M.D.
 Jaime Nos, M.D.
 Henry A. Paul, M.D.
 Linda Pessar, M.D.
 David Reed, M.D.
 Phyllis Robbins, M.D.
 Gary Rusk, M.D.
 Robert Santulli, M.D.
 Jonah W. Schein, M.D.
 Samuel G. Siris, M.D.
 Marsha Speller, M.D.
 Gerda H. Strika, M.D.
 Fidel Swana, M.D.
 Walter Tardy, M.D.
 Peyton Thompson, M.D.
 Richard L. Weidenbacher, M.D.
 Richard W. Weiss, M.D.
 Daniel Williams, M.D.
 Lynn C. Winter, M.D.
 Stuart C. Yudofsky, M.D.

Public Health
BIOSTATISTICIAN

John W. Fertig, PH.D.

PARASITOLOGIST

Michael Katz, M.D.

Radiology Service
DIRECTOR OF SERVICE

William B. Seaman, M.D.

ATTENDING RADIOLOGISTS

David H. Baker, M.D.

Walter E. Berdon, M.D.

† Inactive

§ Pediatric Psychiatry

ATTENDING RADIOLOGISTS (*continued*)

Chu Huai Chang, M.D.
Kent Ellis, M.D.
Sadek Hilal, M.D.
Philip M. Johnson, M.D.
Guy D. Potter, M.D.
Ralph Schlaeger, M.D.
Ernest H. Wood, M.D.

ASSOCIATE ATTENDING RADIOLOGISTS

Thane Asch, M.D.
Frieda Feldman, M.D.
Walter G. Lutz, M.D.
Patricia Tretter, M.D.
Robert L. Waldron, II, M.D.

ASSISTANT ATTENDING RADIOLOGISTS

John Austin, M.D.
William L. Campbell, M.D.
William J. Casarella, M.D.
David A. Follett, M.D.
Shelby J. Galloway, M.D.
Ira A. Horowitz, M.D.
Patricia B. Kaim, M.D.
Donald L. King, M.D.
Peter A. Livingston, M.D.
Harry Morgan, M.D.
James A. Reilly, Jr., M.D.
Louis A. Rottenberg, M.D.
John J. Senyszyn, M.D.
Bruce E. Wiley, M.D.

ASSISTANT RADIOLOGISTS

Claude Yuk-Yeung Chong, M.D.
Herbert Gerstein, M.D.
William Green, M.D.
* Bruce L. McClennan, M.D.
Lawrence R. Muroff, M.D.
Paul Sane, M.D.

RESIDENT

Philip Sorabella, M.D.

ASSISTANT RESIDENTS

Donald M. Bachman, M.D.
Olivera Bedic, M.D.
Thomas J. Black, M.D.
Joel A. Budin, M.D.
Woomyung Choe, M.D.
Octavio G. Choy, M.D.
Brian Donnelly, M.D.
Richard P. Gold, M.D.
Leonidas Harisiadis, M.D.
Charles Heller, M.D.
Conrade C. Jaffee, M.D.
Jack Levenbrown, M.D.
Florence Li, M.D.
Hanna T. Norwint, M.D.
Charles Nosher, M.D.
Louis J. Perl, M.D.
Jeffery R. Poole, M.D.
Barry D. Pressman, M.D.
Keith C. Richards, M.D.
Norman Schulman, M.D.
Ellen F. Silverstein, M.D.

Ellen Slater, M.D.
Richard M. Spiegel, M.D.
Duk Il Sung, M.D.
Richard N. Taxin, M.D.
Joseph F. Walter, M.D.
John J. Witowski, M.D.
Jack Zyroff, M.D.

VISITING FELLOWS

Donald C. Beeckler, M.D.
Loren C. Burger, M.D.
R. Nick Bryan, M.D.
Jack Haller, M.D.
Sharon Kreps, M.D.
Harold Pachtman, M.D.
Thomas Slovis, M.D.
Frederick Thyng, M.D.

Rehabilitation Medicine Service

ATTENDING REHABILITATION PHYSICIAN

John A. Downey, M.D.

ASSOCIATE ATTENDING REHABILITATION PHYSICIANS

Morton Hoberman, M.D.
Shyh-Jong Yue, M.D.

ASSISTANT ATTENDING REHABILITATION PHYSICIANS

Albert D. Anderson, M.D.
Antonio Cocchiarella, M.D.
Stanley J. Myers, M.D.
Naomi Turner, M.D.

ASSOCIATE REHABILITATION PHYSICIAN

Ludmila S. Finkelstein, M.D.

ASSISTANT REHABILITATION PHYSICIANS

Yasoma B. Challenor, M.D.
Cayetano C. Co, M.D.
Lucille Tsu Pai, M.D.
Rodolfo L. Reyes, M.D.
Herbert L. Thornhill, M.D.

ASSISTANT RESIDENTS

Jung-Ho Cho, M.D.
Imende Sutherland, M.D.
Kathleen Watson-Walters, M.D.

VISITING FELLOWS

Arun K. Bhattacharyya, M.D.
Yee Chong Chen, M.D.
Dong Wook Cho, M.D.
Leonore Z. Gladstone, M.D.
Wellington Wei, M.D.

Surgery Service

DIRECTOR OF SERVICE

Keith Reemtsma, M.D.

ATTENDING SURGEONS

Harold G. Barker, M.D.
George F. Crikelair, M.D.
Jose M. Ferrer, Jr., M.D.
David V. Habif, M.D.
Frederic P. Herter, M.D.
Robert B. Hiatt, M.D.
Thomas C. King, M.D.
John M. Kinney, M.D.
James R. Malm, M.D.
Ferdinand F. McAllister, M.D.
Milton R. Porter, M.D.
Thomas V. Santulli, M.D.
Lawrence E. Stevens, M.D.
Arthur B. Voorhees, Jr., M.D.

ASSOCIATE ATTENDING SURGEONS

Hugh Auchincloss, Jr., M.D.
Frederick O. Bowman, Jr., M.D.
Joseph A. Buda, M.D.

† Henry S. F. Cooper, M.D.

Bard Cosman, M.D.

Carl R. Feind, M.D.

Charles W. Findlay, Jr., M.D.

Edmund N. Goodman, M.D.

† Robert S. Grinnell, M.D.

Frank E. Gump, M.D.

Alfred Jaretzki, III, M.D.

David M. C. Ju, M.D.

† Herbert C. Maier, M.D.

Alfred M. Markowitz, M.D.

John B. Price, Jr., M.D.

John F. Prudden, M.D.

Frederick R. Randall, M.D.

Grant Sanger, M.D.

Edward B. Self, M.D.

Francis C. Symonds, Jr., M.D.

Philip D. Wiedel, M.D.

ASSISTANT ATTENDING SURGEONS

Robert G. Bertsch, M.D.
Shivaji B. Bhonslay, M.D.
Harold M. Bruck, M.D.
Richard N. Edie, M.D.
Kenneth A. Forde, M.D.
Paul H. Gerst, M.D.
John E. Hutchinson, M.D.
Sven J. Kister, M.D.

Conrad Lattes, M.D.

* Paul Lo Gerfo, M.D.

John N. Schullinger, M.D.

† John Scudder, M.D.

Richard Weil, III, M.D.

Bashir A. Zikria, M.D.

ASSISTANT SURGEONS

Vincent W. Ansanelli, M.D.
Alfred A. Azzoni, M.D.
Sherman M. Bull, M.D.
Charles A. Slanetz, Jr., M.D.
James S. Todd, M.D.

RESIDENTS

Robert G. Blabey, Jr., M.D.
David Bregman, M.D.

† Inactive
* Leave of Absence

RESIDENTS (*continued*)

Daniel C. Budd, M.D.
 William R. Dietrick, M.D.
 Peter Fodor, M.D.
 Charlton B. Futch, M.D.
 Robert A. Gardner, M.D.
 Roger W. Macmillan, M.D.
 Martin Max, M.D.
 Donald W. Miller, Jr., M.D.
 Henry Spotnitz, M.D.
 George W. Tietjen, M.D.
 Kari Vitikainen, M.D.
 Evan R. Wolarsky, M.D.

ASSISTANT RESIDENTS

Brent R. Ain, M.D.
 Kate N. Aseme, M.D.
 Arnold H. Belgraiier, M.D.
 Michael Bogdasarian, M.D.
 Richard A. Bolt, M.D.
 R. Huntington Breed, II, M.D.
 Leonard A. Bruno, M.D.
 Harry L. Bush, Jr., M.D.
 Jorge L. Camunas, M.D.
 Mark E. Chodoff, M.D.
 Jacob Y. Crittenden, M.D.
 Joseph G. Daines, M.D.
 Ernesto Y. Dy, M.D.
 Howard F. Floch, M.D.
 Owen D. Fraser, M.D.
 Marc Goldstein, M.D.
 Erwin P. Gomez, M.D.
 Richard J. Gusberg, M.D.
 John C. Iacuzzo, M.D.
 Norman Jackman, M.D.
 Gerald Kadis, M.D.
 Mary M. Kemeny, M.D.
 Hernani Mandac, M.D.
 Milton Meyers, M.D.
 Eli Milch, M.D.
 Anthony L. Moulton, M.D.
 George K. Parkins, M.D.
 Gerald H. Pitman, M.D.
 Robert J. Porter, Jr., M.D.
 Edward W. Powers, M.D.
 Theodore D. Probst, M.D.
 Arthur Rettig, M.D.
 Robert A. Stanton, M.D.
 Kenneth Steinglass, M.D.
 David B. Stoeckle, M.D.
 Joseph E. Tripi, M.D.

† *Inactive*

Collin J. Weber, M.D.
 Winfield J. Wells, M.D.
 Anthony Whittemore, M.D.
 Michael Wimsatt, M.D.

RESIDENTS — PLASTIC SURGERY

Atvar S. Dhaliwal, M.D.
 Robert Gutstein, M.D.
 Nunzio Mainierei, M.D.

ASSISTANT RESIDENTS—PLASTIC SURGERY

Stewart B. Heddle, M.D.
 John J. Keyser, M.D.

VISITING FELLOW—PLASTIC SURGERY

Raja K. Srour, M.D.

INTERNS

Charles H. Antinori, M.D.
 Robert B. Armstrong, M.D.
 Howard A. Austin, III, M.D.
 Eric W. Blomain, M.D.
 Anthony Cabot, M.D.
 Frank R. Johnson, M.D.
 Peter F. Lawrence, M.D.
 Stephen J. McIlveen, M.D.
 Kathleen W. McNicholas, M.D.
 Harry Rappaport, M.D.
 Robert A. Riehle, Jr., M.D.
 Donald C. Syracuse, M.D.
 Andrew Zorbis, M.D.

VISITING FELLOWS

Barbara A. Barlow, M.D.
 Eduardo Parodi, M.D.

Urology Service

(J. Bentley Squier Urological Clinic)

DIRECTOR OF SERVICE

John K. Lattimer, M.D.

ATTENDING UROLOGIST

Ralph J. Veenema, M.D.

ASSOCIATE ATTENDING UROLOGISTS

Stanley B. Braham, M.D.
 J. Timothy Donovan, M.D.
 Myron S. Roberts, M.D.
 Aureilo C. Uson, M.D.
 Hans H. Zinsser, M.D.

ASSISTANT ATTENDING UROLOGISTS

Peter N. DeSanctis, M.D.
 John P. Grant, Jr., M.D.
 Frank W. Longo, M.D.
 Peter J. Puchner, M.D.
 Nicholas A. Romas, M.D.
 Arthur M. Smith, M.D.

ASSISTANT UROLOGISTS

Stanley M. Bloom, M.D.
 John C. Byrne, M.D.
 Frederick S. Dick, M.D.
 Louis J. Dougherty, M.D.
 Clement A. Furey, M.D.
 Roberto C. Granato, M.D.
 Philip B. Jensen, M.D.
 Michael W. Justice, M.D.
 Stanley J. Landau, M.D.
 †Meyer M. Melicow, M.D.
 †Stanford Pulrang, M.D.
 Harry Seneca, M.D.
 Charles E. Umhey, Jr., M.D.
 Sander H. Wax, M.D.
 Arthur T. Willetts, M.D.
 Ralph C. Yeaw, M.D.

RESIDENTS

John H. Birkhoff, M.D.
 James K. Mooney, M.D.
 Leonard Rudin, M.D.

ASSISTANT RESIDENTS

Stephen C. Bass, M.D.
 Anthony Horan, M.D.
 John Jaffe, M.D.
 Milton Krisiloff, M.D.
 Steven L. Sholem, M.D.
 Alexander Sotiropoulos, M.D.
 James A. Umhey, M.D.
 Dejo Viprakasit, M.D.
 Michael D. Wechsler, M.D.
 Scott Yeaw, M.D.

VISITING FELLOWS

Rafael O. Carrillo, M.D.
 Gheorghe D. Ionescu, M.D.
 Pravinchandra Patel, M.D.
 Albert T. Touriel, M.D.
 A. Roger Wiederhorn, M.D.

Chiefs of Clinics

Dr. Leonard Brand.....*Anesthesiology*
 Dr. Saul L. Sanders.....*Dermatology*
 Dr. Henry Aranow, Jr.....*Medicine (Group Clinic)*
 Dr. Peter W. Carmel.....*Neurological Surgery*
 Dr. Linda D. Lewis.....*Neurology*
 Dr. Susan W. Williamson....*Obstetrics & Gynecology*
 Dr. George R. Merriam, Jr.....*Ophthalmology*

Dr. Alexander Garcia*Orthopedic Surgery*
 Dr. Robert M. Hui.....*Otolaryngology*
 Dr. Russell S. Asnes.....*Pediatrics*
 Dr. Roger MacKinnon*Psychiatry*
 Dr. Stanley J. Myers.....*Rehabilitation Medicine*
 Dr. Robert G. Bertsch.....*Surgery*
 Dr. Frank W. Longo*Urology*

Faculty of Medicine
College of Physicians and Surgeons
Columbia University in the City of New York

Faculty of Medicine

College of Physicians and Surgeons

Columbia University in the City of New York

Officers of the Faculty of Medicine

William J. McGill, PH.D.....	<i>President of the University</i>
Wm. Theodore deBary, PH.D.....	<i>Executive Vice President for Academic Affairs and Provost</i>
Paul A. Marks, M.D.....	<i>Vice President for Health Sciences</i>
Donald F. Tapley, M.D.....	<i>Acting Dean of Faculty of Medicine</i>
Frederick B. Putney, PH.D.....	<i>Assistant Vice President in Charge of Medical Affairs</i>
Jose M. Ferrer, M.D.....	<i>Associate Dean for Postgraduate Education</i>
Frederick G. Hofmann, PH.D.....	<i>Associate Dean for Admissions</i>
George I. Lythcott, M.D.....	<i>Associate Dean for Urban and Community Health Affairs</i>
Councilman Morgan, M.D.....	<i>Associate Dean for Curriculum and Student Affairs</i>
Ann S. Peterson, M.D.....	<i>Associate Dean for Student Affairs</i>
Bernard Schoenberg, M.D.....	<i>Associate Dean for Allied Health Affairs</i>
John H. Bryant, M.D.....	<i>Associate Dean (Public Health)</i>
Mary I. Crawford, ED.D.....	<i>Associate Dean (Nursing)</i>
Bernard D. Challenor, M.D.....	<i>Assistant Dean for Community and Urban Health Affairs</i>
Inez E. Klinck, B.A.....	<i>Assistant Dean for Academic Affairs</i>

Executive Committee of the Faculty of Medicine

Kimball G. Atwood	John A. Downey	Wilbur H. Sawyer
Richard E. Behrman	Donald S. Kornfeld	Joseph G. Sweeting
Edward T. Bowe	Mero R. Nocenti	Donald F. Tapley
Mary I. Crawford	Gerard P. Pereira	Gilbert P. Vosburgh
	Charles T. Ryder	

Faculty Council of the Faculty of Medicine

David L. Andrews	Arthur C. Carr	Ann Earle
Thomas P. Ashford	Herbert G. Cave	Kent Ellis
Charles A. Ashley	Bernard D. Challenor	Paul D. Ellner
Russell S. Asnes	Chu H. Chang	Bernard F. Erlanger
Kimball C. Atwood	Erwin Chargaff	Jose M. Ferrer
Esther B. Austin	James W. Correll	Mieczyslaw Finster
Daniel C. Baker, Jr.	Joe E. Coward	Sidney Gilman
David H. Baker	Mary I. Crawford	Harold S. Ginsberg
Milos Basek	Charles W. Davidson	Eli S. Goldensohn
Richard E. Behrman	Robert M. Day	Jack W. C. Hagstrom
Henrik Bendixen	Richard F. Defendini	Leonard C. Harber
Alvin J. Binkert	Felix E. Demartini	Wendell B. Hatfield
Martin Blank	Edward W. Dempsey	Brian F. Hoffman
Edward T. Bowe	A. Gerard DeVoe	Frederick G. Hofmann
Frederick O. Bowman	John A. Downey	Georgianna Jagiello
Philip W. Brandt	Elinor F. Downs	Althea M. Jones
John H. Bryant	John M. Driscoll, Jr.	S. Lee Jones
Vincent P. Butler, Jr.	Philip E. Duffy	Joannes H. Karis

Faculty Council of the Faculty of Medicine—Continued

Michael Katz	Mero R. Nocenti	William B. Seaman
Gordon Kaye	Eugene J. Pantuck	Margarita Silva-Hutner
Donald L. King	George O. Papanek	Lance Simpson
Donald W. King	Robert Pascal	Sol Spiegelman
Inez E. Klinck	Gerard P. Pereira	P. R. Srinivasan
Lawrence C. Kolb	Ann S. Peterson	Frank E. Stinchfield
Donald S. Kornfeld	Helen F. Pettit	Joseph G. Sweeting
Alvin Krasna	Harriet B. Presser	Francis C. Symonds, Jr.
Robert S. Krooth	Frederick B. Putney	John V. Taggart
John H. Laragh	Charles A. Ragan, Jr.	Donald F. Tapley
John K. Lattimer	Keith Reemtsma	Joseph V. Terenzio
Regina L. Loewenstein	Ellen F. Regan	Peter B. Terenzio
Frank W. Longo	Richard A. Rifkind	Herbert L. Thornhill
George I. Lythcott	Lewis P. Rowland	Raymond L. Vande Wiele
Mary C. MacKay	Charles T. Ryder	Theodore B. Van Itallie
Paul A. Marks	Ernest Salanitire	Ralph J. Veenema
David J. McConnell	Saul L. Sanders	Arthur B. Voorhees
Gilbert W. Mellin	Wilbur H. Sawyer	Gilbert P. Vosburgh
Councilman Morgan	David Schachter	Arthur R. Wertheim
Melvin L. Moss	Edward B. Schlesinger	Walter A. Wichern
Lester A. Mount	Bernard Schoenberg	Charles Windsor
Richard Moyer	John N. Schullinger	Myron Winick
Harold C. Neu	Malcolm H. Schvey	James A. Wolfe
Charles R. Noback		Bashir A. Zikria

Academic Committees

CHAIRMEN'S ADVISORY COMMITTEE TO THE DEAN

Donald F. Tapley, Chairman

Daniel C. Baker, Jr.	Harold S. Ginsberg	Charles A. Ragan
Richard E. Behrman	Leonard Harber	Keith Reemtsma
Henrik Bendixen	Brian E. Hoffman	Lewis P. Rowland
Alvin J. Binkert	Frederick G. Hofmann	Bernard Schoenberg
John H. Bryant	Donald W. King	William B. Seaman
Bernard Challenor	Lawrence C. Kolb	Sol Spiegelman
Erwin Chargaff	Robert S. Krooth	Frank E. Stinchfield
Mary I. Crawford	John K. Lattimer	John V. Taggart
Charles W. Davidson	George I. Lythcott	Peter B. Terenzio
Edward W. Dempsey	Councilman Morgan	Raymond L. Vande Wiele
A. Gerard DeVoe	Lester A. Mount	Myron Winick
Jose M. Ferrer	Ann S. Peterson	Edward B. Zegarelli
	Frederick B. Putney	

COMMITTEE ON ADMISSIONS

Frederick G. Hofmann, Chairman

Albert A. Anderson	Frank Gump	Richard I. Stock
Hugh F. Butts	Wendell Hatfield	Joseph A. Silverman
Carolyn Denning	Allen I. Hyman	Philip D. Wiedel
Anthony Donn	Norman Kahn	Donald F. Tapley, Acting Dean,
John A. Downey	Albert R. Lamb, Jr.	<i>ex officio</i>
Kenneth A. Forde	Robert Michels	Students:
Andrew G. Frantz	Mero Nocenti	Lawrence D. Lunsford
S. Raymond Gambino	Ann S. Peterson	David Royce

COMMITTEE ON POSTGRADUATE INSTRUCTION

Jose M. Ferrer, Chairman

Nicholas P. Christy	Councilman Morgan	Alexander W. Young
Frederic P. Herter	Charles T. Ryder	Donald F. Tapley, Acting Dean,
Robert Michels	John V. Taggart	<i>ex officio</i>
	Gerald E. Thomson	

CURRICULUM COMMITTEE

Councilman Morgan, Chairman

Ernest W. April
Robert E. Canfield
John L. Colombotos
Edward M. Dwyer
Alexander Garcia
Lowell M. Greenbaum

Peter R. Holt
Georgiana Jagiello
Thomas C. King
Raffaele Lattes
Martin I. Lorin
Robert Michels

Harold Neu
Mero Nocenti
Bernard Schoenberg
P. R. Srinivasan
I. Bernard Weinstein
Philip Wiedel

DELEGATES TO THE UNIVERSITY SENATE

Jennifer Bell
Jose M. Ferrer
Alexander Garcia

Jerry C. Jacobs
A. Gregory Jameson

Paul A. Marks
Robert Michels
Hymie L. Nossel

Joint Committees of Faculty of Medicine and Professional Staff of Presbyterian Hospital

ADVISORY COMMITTEE ON PRIVATE PRACTICE

Donald F. Tapley, Chairman

Richard E. Behrman
A. J. Binkert

Charles A. Ragan
Keith Reemtsma
Lewis P. Rowland

Frank Stinchfield
Raymond L. Vande Wiele

JOINT COMMITTEE OF THE FACULTY AND THE MEDICAL BOARD ON THE FACILITIES OF THE MEDICAL CENTER

A. J. Binkert, Co-Chairman

Donald F. Tapley, Co-Chairman

Richard E. Behrman
Mary I. Crawford
Harold S. Ginsberg
Richard N. Kerst
Donald W. King
Lawrence C. Kolb

John K. Lattimer
George I. Lythcott
Paul A. Marks
Milton R. Porter
Frederick B. Putney
Charles A. Ragan

Keith Reemtsma
Lewis P. Rowland
William B. Seaman
Frank Stinchfield
Raymond L. Vande Wiele
Carl R. Wise

School of Dental and Oral Surgery

Columbia University in the City of New York

Officers of the Faculty of Dental and Oral Surgery

William J. McGill, P.H.D.....	<i>President of the University</i>
Wm. Theodore deBary, PH.D., L.H.D., D.LITT....	<i>Executive Vice President for Academic Affairs and Provost of the University</i>
James S. Young, PH.D.....	<i>Deputy Vice President for Academic Affairs</i>
Paul A. Marks, M.D.	<i>Vice President for Health Sciences</i>
Edward V. Zegarelli, D.D.S., M.S.....	<i>Dean</i>
Stephen Wotman, D.D.S.....	<i>Special Assistant to the Dean</i>
Harold L. Applewhite, D.D.S., M.P.H.....	<i>Associate Professor of Dentistry</i>
Herbert D. Ayers, D.D.S.....	<i>Associate Professor of Dentistry</i>
Edward A. Cain, Jr., D.D.S.....	<i>Professor of Dentistry</i>
Erwin Chargaff, PH.D.....	<i>Professor of Biochemistry</i>
Joseph A. Cuttita, D.D.S.....	<i>Professor of Dentistry</i>
Edward W. Dempsey, PH.D.....	<i>Professor of Anatomy</i>
Nicholas A. Di Salvo, D.D.S., PH.D.....	<i>Professor of Dentistry</i>
Harold S. Ginsberg, M.D.....	<i>Professor of Microbiology</i>
Robert Gottsegen, D.D.S.....	<i>Professor of Dentistry</i>
Brian F. Hoffman, M.D.....	<i>David Hosack Professor of Pharmacology</i>
Sidney L. Horowitz, D.D.S.....	<i>Professor of Dentistry</i>
Donald W. King, M.D.....	<i>Francis Delafield Professor of Pathology</i>
Austin H. Kutscher, D.D.S.....	<i>Associate Professor of Dentistry</i>
Joseph M. Leavitt, D.D.S.....	<i>Clinical Professor of Dentistry</i>
John J. Lucca, D.D.S.....	<i>Professor of Dentistry</i>
Patricia A. McLean, M.A.....	<i>Associate Professor of Dental Hygiene</i>
Irwin D. Mandel, D.D.S.....	<i>Professor of Dentistry</i>
Louis Mandel, D.D.S.....	<i>Clinical Professor of Dentistry</i>
George A. Minervini, D.D.S.....	<i>Clinical Professor of Dentistry</i>
Henry I. Nahoum, D.D.S.....	<i>Associate Professor of Dentistry</i>
Irving J. Naidorf, D.D.S.	<i>Clinical Professor of Dentistry</i>
Solomon N. Rosenstein, D.D.S.....	<i>Professor of Dentistry</i>
David J. Smith, D.D.S.....	<i>Associate Professor of Dentistry and Associate Professor of Biochemistry</i>
John V. Taggart, M.D.....	<i>Professor of Physiology</i>
Ennio L. Uccellani, D.D.S.....	<i>Associate Professor of Dentistry</i>

Academic Committees

EXECUTIVE COMMITTEE (Department of Dental and Oral Surgery)

Acting Dean Edward V. Zegarelli, Chairman

Harold L. Applewhite
Edward A. Cain, Jr.
Nicholas A. Di Salvo
Robert Gottsegen

Sidney L. Horowitz
Joseph M. Leavitt
John J. Lucca
Patricia A. McLean

Irwin D. Mandel
George A. Minervini
Solomon N. Rosenstein
David J. Smith

COMMITTEE ON ADMISSIONS (UNDERGRADUATE)

Joseph A. Cuttita, Chairman

Stanislaw H. Brzustowicz
Victor S. Caronia

Henry I. Nahoum
David J. Smith
Albert N. Zengo

Acting Dean Edward V. Zegarelli
(Ex Officio)

COMMITTEE ON ADMISSIONS (DENTAL HYGIENE)

Patricia A. McLean, Chairman

Joseph A. Cuttita

Marlene Klyvert
Dona E. W. McKinney

Acting Dean Edward V. Zegare
(Ex Officio)

COMMITTEE ON INSTRUCTION

Edward A. Cain, Jr., Chairman

Harold L. Applewhite
Edward W. Dempsey
Nicholas A. Di Salvo
Samuel F. Dworkin
Harold S. Ginsberg
Louise A. Goode
Robert Gottsegen
Sidney L. Horowitz

Norman Kahn
David Kaplan
Donald W. King
Joseph M. Leavitt
Andrew M. Linz
John J. Lucca
Patricia A. McLean
Irwin D. Mandel

George A. Minervini
Letty Moss-Salentijn
Charles R. Noback
Mero R. Nocenti
Solomon N. Rosenstein
David J. Smith
Edward Stroh
Acting Dean Edward V. Zegare
(Ex Officio)

POSTGRADUATE COMMITTEE

Irving J. Naidorf, Chairman

Joseph A. Cuttita
Nicholas A. Di Salvo
Robert Gottsegen

Joseph M. Leavitt
Melvin L. Moss
Letty Moss-Salentijn

Philip Person
Solomon N. Rosenstein
Acting Dean Edward V. Zegare
(Ex Officio)

DELEGATES TO UNIVERSITY SENATE

Representing Tenured Faculty Edward A. Cain, Jr.
Representing Non-Tenured Faculty S. Abel Moreinis
Representing students of the School of Dental and Oral Surgery George Nahas

Academic Staff

College of Physicians and Surgeons
Columbia University in the City of New York

Academic Staff

College of Physicians and Surgeons

Columbia University in the City of New York

Emeritus Officers

J. Burns Amberson.....*Medicine*
 Dana W. Atchley*Medicine*
 Frank B. Berry*Surgery*
 Harold W. Brown*Parasitology*
 Gordon M. Bruce*Ophthalmology*
 John Caffey*Radiology*
 Lester Cahn*Oral Pathology*
 Wilfred M. Copenhagen*Anatomy*
 André F. Courmand*Medicine*
 Robert C. Darling*Rehabilitation Medicine*
 D. Anthony D'Esopo*Obstetrics and Gynecology*
 Zacharias Dische*Biochemistry*
 John H. Dunnington*Ophthalmology*
 Herbert O. Elftman*Anatomy*
 George W. Fish*Urology*
 Charles A. Flood*Medicine*
 Goodwin L. Foster*Biochemistry*
 Jacob Furth*Pathology*
 Elizabeth S. Gill*Nursing*
 Ross Golden*Radiology*
 Leonard J. Goldwater*Occupational Medicine*
 Harry Grundfest*Neurology*
 Cushman D. Haagensen*Surgery*
 Michael Heidelberger*Immunochemistry*
 Paul F. A. Hofer*Neurology*
 George H. Humphreys II*Surgery*
 Harold W. Jacox*Radiology*
 Maxwell Karshan*Biochemistry*
 Forrest E. Kendall*Biochemistry*
 William S. Langford*Psychiatry*

Margaret R. Murray LeDoux*Anatomy*
 Robert L. Levy*Medicine*
 Rustin McIntosh*Pediatrics*
 Meyer M. Melicow*Urology*
 H. Houston Merritt. .*Dean Emeritus and Vice President*
 Emeritus in Charge of Medical Affairs
 Karl Meyer*Biochemistry*
 David Nachmansohn*Biochemistry*
 Carl T. Nelson*Dermatology*
 Phillip O. Polatin*Psychiatry*
 J. Lawrence Pool*Neurological Surgery*
 Edith H. Quimby*Radiology (Physics)*
 Willard C. Rappleye. .*Dean Emeritus and Vice President*
 Emeritus in Charge of Medical Affairs
 Fordyce B. St. John*Surgery*
 John E. Scarff*Neurological Surgery*
 William H. Sebrell, Jr.*Nutrition*
 Beatrice C. Seegal*Microbiology*
 Aura E. Severinghaus*Anatomy and Associate*
 Dean Emeritus
 Lawrence W. Sloan*Surgery*
 Alan DeF. Smith*Orthopedic Surgery*
 William Benham Snow*Physical Medicine*
 Warren M. Sperry*Biochemistry*
 Howard C. Taylor*Obstetrics and Gynecology*
 Benjamin P. Watson*Obstetrics and Gynecology*
 Jerome P. Webster*Surgery*
 Maynard C. Wheeler*Ophthalmology*
 Abner Wolf*Neuropathology*
 Joseph Zubin*Psychology*

Anatomy

PROFESSORS

Malcolm B. Carpenter, M.D.
 Edward W. Dempsey, M.D.
 (Chairman)
 Frederick A. Mettler, M.D.
 (Neurology)
 Melvin L. Moss, D.D.S.
 Charles R. Noback, PH.D.

ASSOCIATE PROFESSORS

Frederic J. Agate, PH.D.
 Philip W. Brandt, PH.D.
 Charles A. Ely, PH.D.

ADJUNCT ASSOCIATE PROFESSOR

Richard M. Hoar

ASSISTANT PROFESSORS

Ernest W. April, PH.D.
 William G. Dilley, PH.D.
 Ray C. Henrikson, PH.D.
 Mary M. L. Lee
 W. Patrick Lockett, PH.D.
 Letty Moss-Salentijn, D.D.S.
 (Oral Biology)
 Gerard P. Pereira, PH.D.
 John J. Rasweiler, IV, PH.D.
 Robert W. Rice, PH.D.
 (Orthopedic Surgery)

ADJUNCT ASSISTANT PROFESSORS

Marie D. Felix, PH.D.
 Shih-Chang Shen, PH.D.

RESEARCH ASSOCIATE

Robert J. Demarest

SPECIAL LECTURERS

Edmund Applebaum, D.D.S.
 Joseph Reibeisen, B.S.

Anesthesiology

PROFESSORS

Henrik Bendixen, M.D.
 (Chairman)
 L. Stanley James, M.D.
 (from Pediatrics)
 Lester C. Mark, M.D.
 Gabriel G. Nahas, M.D.
 Shih-Hsun Ngai, M.B.
 Herbert Rackow, M.D.

PROFESSORS OF CLINICAL ANESTHESIOLOGY

Leonard Brand, M.D.
 Edgar C. Hanks, M.D.
 Ernest Salanitro, M.D.
 Herman Schwartz, M.D.

ADJUNCT PROFESSOR

Sidney Spector, M.D.
 (See Pharmacology)

ASSOCIATE PROFESSORS

Mieczyslaw Finster, M.D.
 Allen I. Hyman, M.D.
 Joannes H. Karis, M.D.
 Paul J. Poppers, M.D.
 Stuart F. Sullivan, M.D.

ASSOCIATE PROFESSOR OF CLINICAL ANESTHESIOLOGY

Charles E. Wolf, M.D.

ASSISTANT PROFESSORS

Robert T. Donham, M.D.
 Ralph A. Epstein, M.D.
 Jean Henley, M.D.
 Vance Lauderdale, Jr., M.D.
 Shirley J. Markee, M.D.
 Richard S. Matteo, M.D.
 Hisayo O. Morishima, M.D.
 Eugene J. Pantuck, M.D.
 Hilda Pedersen, M.D.
 Daniel M. Pino, M.D.
 Lubos Triner, M.D.

ASSISTANT PROFESSORS OF CLINICAL ANESTHESIOLOGY

Veronica Bakamjian, M.D.
 Arnold St. J. Lee, B.A.
 J. Gilbert Stone, M.D.

ASSOCIATES

Dorothy A. H. Black, M.D.
 Bernard E. Filner, M.D.
 Carolyn P. Greenberg, M.D.
 Hoshang J. Khambatta, M.D.
 Raymond B. Laravuso, M.D.
 Krishan Malik, M.D.
 Joseph Chuan-Shih Yang

RESEARCH ASSOCIATES

Salha S. Daniel, Ph.D.
 James Frank Schauble, M.D.
 Mariagnes Verosky, B.A.
 Yvonne Vulliemoz, Ph.D.

INSTRUCTORS

Kathryn A. W. Cozine, M.D.
 Gerald L. Feinberg, M.D.
 Ernst Heilbrunn, M.D.
 Anthony J. Salvatore, M.D.
 Anthony E. Wickremesinghe, M.D.

At Mary Imogene Bassett Hospital:**ASSISTANT CLINICAL PROFESSOR**

William F. Karl, M.D.

At Harlem Hospital:**ASSOCIATE CLINICAL PROFESSOR**

Herbert G. Cave, M.D.

ASSISTANT CLINICAL PROFESSORS

Samuel C. Brisbane, M.D.
 Oscar N. Graves, M.D.
 Archibald K. Hinds, M.D.
 Gilbert Phanor, M.D.
 Stephanie Shich, M.D.
 Francis Weekes, M.D.

At Roosevelt Hospital:**ASSISTANT CLINICAL PROFESSORS**

Ronald A. Andree, M.D.
 Richard Keenan, M.D.

INSTRUCTORS

Ignacio U. Ngo, M.D.
 William M. Smith, M.D.

At St. Luke's Hospital:**ASSOCIATE PROFESSOR OF CLINICAL ANESTHESIOLOGY**

Louis S. Blancato, M.D.

ASSISTANT PROFESSOR OF CLINICAL ANESTHESIOLOGY

Ennio Gallozzi, M.D.

ASSISTANT CLINICAL PROFESSORS

Errol N. Harding, M.D.
 Aino Tuul, M.D.

ASSOCIATES

Joseph Jacovelli, M.D.
 Hilda H. C. Liu, M.D.
 Alfred T. C. Peng, M.D.
 Altagracia H. Polanco, M.D.

INSTRUCTORS

Ming C. Chiou, M.D.
 Julio M. Garcia Rodriguez, M.D.

Biochemistry**PROFESSORS**

Reinhold Benesch, Ph.D.
 Erwin Chargaff, Ph.D.
 (Chairman)
 Max A. Eisenberg, Ph.D.
 Philip Feigelson, Ph.D.
 (Cancer Research)
 Alvin I. Krasna, Ph.D.
 Seymour Lieberman, Ph.D.
 (Obstetrics and Gynecology)
 Maurice M. Rapport, Ph.D.
 (Psychiatry)
 David B. Sprinson, Ph.D.
 Parithychery R. Srinivasan, Ph.D.

PROFESSOR OF BIOCHEMICAL CRYSTALLOGRAPHY

Barbara W. Low, Ph.D.

ASSOCIATE PROFESSORS

Ruth E. Benesch, Ph.D.
 Allen M. Gold, Ph.D.
 Dezider Grunberger, Ph.D.
 (Inst. of Cancer Res.)
 John D. Karkas, Ph.D.
 David J. Smith, D.D.S.

ASSISTANT PROFESSORS

George Alexander, Ph.D.
 (Psychiatry)
 Elinor F. Brunngraber, Ph.D.
 Gerald Cohen, Ph.D.
 (Psychiatry)
 Irving Goodman, Ph.D.
 (Surgery)
 Ronald L. Hanson, Ph.D.
 Kenneth O. Lloyd, Ph.D.
 (Dermatology)
 Herbert Meltzer, Ph.D.
 (Psychiatry)
 Richard W. Moyer, Ph.D.
 Terrone L. Rosenberry, Ph.D.
 Lawrence E. Skogerson, Ph.D.
 Benjamin Weiss, Ph.D.
 (Psychiatry)

ADJUNCT ASSISTANT PROFESSORS

Liese L. Abell, Ph.D.
 (Medicine)
 Edith G. Gollub, Ph.D.

RESEARCH ASSOCIATES

Mella Adlersberg, M.S.
 Jean Dayan, Ph.D.
 Herman Kaufman, Ph.D.
 (Psychiatry)
 Alemka Kiscic, Ph.D.
 (Psychiatry)
 Sahebarao P. Mahadik, Ph.D.
 Utpalendu S. Maitra, Ph.D.
 V. L. N. Murty, Ph.D.
 (Ophthalmology)
 Laura Ponticorvo, Ph.D.
 Hugh S. Preston, M.D.
 Ildiko Radichevich, Ph.D.
 (Medicine)
 Lawrence S. Rosen, Ph.D.
 Andrew D. Rudko, Ph.D.
 Dorothy Srinivasan, Ph.D.
 Joannis G. Stravrianopoulos, Ph.D.
 Hadassah Tamir, Ph.D.
 Paul J. Trocha, Ph.D.
 Paula E. Zimmering, Ph.D.
 (Obstetrics and Gynecology)

SPECIAL LECTURERS

Zacharias Dische, M.D.
 Forrest E. Kendall, Ph.D.
 (Medicine)
 Karl Meyer, M.D.
 (Medicine)
 David Nachmansohn, M.D.
 (Neurology)

At Mary Imogene Bassett Hospital:

ASSOCIATE

Theodore Peters, Jr., PH.D.
(Medicine)

Dermatology

PROFESSOR

Leonard C. Harber, M.D.
(Chairman)

CLINICAL PROFESSORS

Anthony N. Domonkos, M.D.
Saul L. Sanders, M.D.
Lewis Shapiro, M.D.

ASSOCIATE PROFESSOR

Margareta Silva-Hutner, PH.D.

ASSOCIATE CLINICAL PROFESSOR

Richard A. Walzer, M.D.

ASSISTANT PROFESSORS

David R. Bickers, M.D.
Kenneth O. Lloyd, PH.D.
(from Biochemistry)
Maureen B. Poh, M.D.
Alan R. Shalita, M.D.

ASSISTANT CLINICAL PROFESSORS

Irving Abrahams, M.D.
Jack Eisert, M.D.
James P. Fields, M.D.
Meyer H. Slatkin, M.D.

ASSOCIATE

William G. Atwood, M.D.

RESEARCH ASSOCIATES

Julia M. Einbinder, M.S.
Wei-Li S. Lee, PH.D.

INSTRUCTORS

Einar A. Juhlin, M.D.
Theodore A. Labow, M.D.

ASSISTANTS

Elaine V. Di Grande, M.D.
Robert P. Feinstein, M.D.
Burton S. Koplon, M.D.
Mark S. Lichtenberg, M.D.
Joseph A. Penner, M.D.
Jack H. Rozen, M.D.
Joseph S. Shapiro, M.D.
Eva B. Stahl, M.D.
Hilda G. Straker, M.D.
Harvey Ira Weinberg, M.D.

LECTURERS

Arturo L. Carrion, M.D.
Angelo A. Lamola, PH.D.

SPECIAL LECTURER

J. Lowry Miller, M.D.

At Harlem Hospital:

ASSISTANT CLINICAL PROFESSOR

Henry L. Hines, M.D.

At Roosevelt Hospital:

ASSISTANT

David Sibulkin, M.D.

At St. Luke's Hospital:

ASSOCIATE CLINICAL PROFESSOR

Alexander W. Young, Jr., M.D.

INSTRUCTORS

Peter C. Lombardo, M.D.
Eugene W. Sweeney, M.D.

ASSISTANT

William R. Barbee, M.D.

**Human Genetics
and Development**

PROFESSORS

Kimball C. Atwood, M.D.
Georgiana Jagiello, M.D.
(see Obstetrics and Gynecology)
Elvin A. Kabat, PH.D.
(Microbiology)
Robert S. Krooth, M.D.
(Chairman)
Paul A. Marks, M.D.
(Medicine)
Orlando J. Miller, M.D.
(Obstetrics and Gynecology)
Richard A. Rifkind, M.D.
(Medicine)
Sol Spiegelman, PH.D.
(Cancer Research)

PROFESSOR OF MATHEMATICAL
STATISTICS AND GENETICS

Howard Levene, PH.D.

ADJUNCT PROFESSORS

Sidney Udenfriend, PH.D.
Arthur Weissbach, PH.D.
Herbert Weissbach, PH.D.

ASSOCIATE PROFESSOR

Arthur Bank, M.D.

ASSISTANT PROFESSORS

Vaithilingam G. Dev, PH.D.
Daniel L. Kacian, PH.D.
Fred R. Kramer, PH.D.
Donald Kufe, M.D.
George M. Maniatis, M.D.
Dorothy A. Miller, PH.D.
Donald R. Mills, PH.D.
(Cancer Research)
Masaaki Terada, M.D.
Dorothy Warburton, PH.D.

ADJUNCT ASSISTANT PROFESSOR

Mihaly Bartolos, M.D.

RESEARCH ASSOCIATES

Harlow K. Fischman, PH.D.
Ann S. Henderson, PH.D.
Julia B. Jones
Selina C. Kiang
Donald J. Komma, PH.D.
George F. Lam, M.S.
Pamela J. Malfoix, PH.D.
Stephanie Phillips, PH.D.
Francesco Ramirez, PH.D.
Ming Tsung Yu, PH.D.

INSTRUCTOR

Harold I. Calvin, PH.D.

Medicine

PROFESSORS

Stanley E. Bradley, M.D.
(Bard Professor)
Robert E. Canfield, M.D.
Andrew G. Frantz, M.D.
DeWitt S. Goodman, M.D.
(Tilden-Weger-Bieler Professor)
Rejane M. Harvey, M.D.
Paul A. Marks, M.D.
(see Human Genetics and
Development)
Hymie L. Nossel, M.D.
Elliott F. Osserman, M.D.
Charles A. Ragan, M.D.
(Lambert Professor and
Chairman)
Richard A. Rifkind, M.D.
(see Human Genetics and
Development)
John V. Taggart, M.D.
(see Physiology)
Donald F. Tapley, M.D.
(Acting Dean)
Gerard M. Turino, M.D.
I. Bernard Weinstein, M.D.
Arthur R. Wertheim, M.D.

PROFESSORS OF CLINICAL MEDICINE

Henry Aranow, Jr., M.D.
Felix E. Demartini, M.D.
M. Irene Ferrer, M.D.
John H. Laragh, M.D.
Edgar Leifer, M.D.
Sidney C. Werner, M.D.

CLINICAL PROFESSORS

Stuart W. Cosgriff, M.D.
Kermit L. Pines, M.D.
Alfred Steiner, M.D.

ASSOCIATE PROFESSORS

Arthur Bank, M.D.
J. Thomas Bigger, M.D.
Vincent P. Butler, M.D.
Peter Caldwell, M.D.
Paul J. Cannon, M.D.
John S. Kovach, M.D.
E. Carwile LeRoy, M.D.
John Loeb, M.D.

Medicine (continued)

Thomas Q. Morris, M.D.
 Harold C. Neu, M.D.
 Ann S. Peterson, M.D.
 (Associate Dean)
 Richard S. Rivlin, M.D.

ASSOCIATE PROFESSORS OF CLINICAL MEDICINE

Shirley C. Fisk, M.D.
 Donald A. Holub, M.D.
 Albert R. Lamb, Jr., M.D.
 George W. Melcher, M.D.

ASSOCIATE CLINICAL PROFESSORS

Hylan A. Bickerman, M.D.
 John O. Burris, M.D.
 Henry Colcher, M.D.
 Albert W. Grokoest, M.D.
 George A. Hyman, M.D.
 Abbie I. Knowlton, M.D.
 Robert A. Kritzler, M.D.
 George H. McCormack, M.D.
 Jay I. Meltzer, M.D.
 Robert P. Noble, M.D.
 Richard J. Stock, M.D.
 John A. Wood, M.D.

ASSISTANT PROFESSORS

Leslie Baer, M.D.
 Hans R. Brunner, M.D.
 Medhi Farhangi, M.D.
 Wylie C. Hembree, M.D.
 (see Obstetrics and Gynecology)
 Ginette B. Jacob, M.D.
 F. David Kitchin, M.D.
 Roger L. Lerner, M.D.
 Jane H. Morse, M.D.
 Elizabeth R. Prichard, M.S.
 (Medical Social Service)
 Marshall P. Primack, M.D.
 John L. Roglieri, M.D.
 Donald H. Schmidt, M.D.
 Frank R. Smith, M.D.
 Henry M. Thomas III, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Michael H. Cohen, M.D.
 John van B. Dean, M.D.
 Robert H. De Bellis, M.D.
 Wendell B. Hatfield, M.D.
 Robert H. Heissenbittel, M.D.
 William P. Lovejoy, M.D.
 Hans W. Neuberger, M.D.
 Peter E. Schrag, M.D.
 Jeffrey A. Stein, M.D.
 Joseph G. Sweeting, M.D.
 Robert T. Whitlock, M.D.
 Carl R. Wise, M.D.

ASSISTANT CLINICAL PROFESSORS

Casco Alston, M.D.
 John L. Buchanan, M.D.
 Clarence J. D'Alton, M.D.
 Richard B. Duane, Jr., M.D.

Juan G. Edreira, M.D.
 Paul K. Johnson, M.D.
 Daniel L. Larson, M.D.
 Cornelius J. Tyson, M.D.
 Earl A. Wheaton, Jr., M.D.

ADJUNCT ASSISTANT PROFESSOR

Liese L. Abell, PH.D.
 (from Biochemistry)

ASSOCIATES

Carol H. Bosken, M.D.
 Geraldine P. Bradley, M.D.
 James A. Brown, M.D.
 Daniel S. J. Choy, M.D.
 John M. Daley, M.D.
 Ronald E. Drusin, M.D.
 Dorothy Estes, M.D.
 Charles Faverio, M.D.
 Elsa-Grace V. Giardina, M.D.
 Lionel Grossbard, M.D.
 George C. Hennig, M.D.
 James A. Hogan, M.D.
 Marvin M. Lipman
 Arnold L. Lisio, M.D.
 Kenneth A. McClane, M.D.
 Carmen I. Ortiz Neu, M.D.
 Kenneth M. Prager, M.D.
 Edith B. Reilly, M.D.
 Harvey A. Schneier, M.D.
 Arthur I. Snyder, M.D.
 Melvin B. Weiss, M.D.
 Gail S. Williams, M.D.

RESEARCH ASSOCIATES

Kathrine J. Baker, M.A.
 Khalid Beg, M.D.
 Sophie B. Bilezikian, M.D.
 Bonnie A. Bray, PH.D.
 Jaime B. Coelho, M.D.
 Haralambos P. Gavras, M.D.
 Irene Gavras, M.D.
 Elizabeth J. Harfenist, M.D.
 Yoshikazu Kanda, PH.D.
 Hans-Jorg Keim, M.L.
 Kaichi Kida, M.D.
 Anantha K. Mallia, PH.D.
 George Mallis, M.D.
 Hildegard R. Maricq, M.D.
 Peter O. Milch, M.D.
 Idliko Radichevich, PH.D.
 (from Biochemistry)
 Rajasekhar Ramakrishnan, M.D.
 Jose R. Rodriguez, M.D.
 Phyllis M. Sampson, M.D.
 Jean E. Sealey, B.S.
 Glenn Keith Sherer, M.D.
 John E. Smith, PH.D.
 Julio E. Sotelo, M.D.
 Ian M. Yudelman, M.D.

INSTRUCTORS

Stewart F. Alexander, M.D.
 Howard J. Barnum, M.D.
 Eli Bauman, M.D.
 Martin E. Bloomfield, M.D.
 Ralph S. Blume, M.D.

Jean E. Collard, M.A.
 (Medical Social Work)
 J. Kirby Cunningham, M.D.
 Agnes D. Dilworth, M.S.S.
 (Medical Social Work)
 Lloyd C. Fisher, M.D.
 Lonnie B. Hanauer, M.D.
 Ralph J. Herz, M.D.
 Elias M. Kaimakliotis, M.D.
 Constantine P. Ladopoulos, M.D.
 Catherine I. Lang, B.A.
 Daniel L. Macken, M.D.
 James A. L. Mathers, M.D.
 Marc E. Newberg, M.D.
 Eduardo R. Pons, M.D.
 Alex Sahagian-Edwards, M.D.
 Helen Van Alstine, M.D.
 Cristobal A. Vicens, M.D.

ASSISTANTS

John T. Beaty, M.D.
 Alfred Becker, M.D.
 Bernard C. Burnett, M.D.
 Nicholas A. Cannarozzi, M.D.
 James A. Coss, Jr., M.D.
 Dorothy A. Erickson, M.D.
 Helen-Ann Garcia, M.D.
 Mohsen Ghaemmagham, M.D.
 Irwin Goldstein, M.D.
 Joseph Heller, M.D.
 Robert L. Kozam, M.D.
 Pier Mancuso-Ungaro, M.D.
 Mato L. Marinovich, M.D.
 Michael Meyer
 John E. Postley, M.D.
 Milovan T. Rakic, M.D.
 Morris R. Rapoport, M.D.
 Steven R. Rheingold, M.D.
 John M. Rodgers, M.D.
 Alan L. Saroff, M.D.
 Theodore J. Stahl, M.D.

SPECIAL LECTURERS

André Cournand, M.D.
 Forrest Kendall, M.D.
 Karl Meyer, M.D.
 (Biochemistry)
 Hamilton Southworth, M.D.

LECTURERS

Edward E. Fischel, M.D.
 John H. McClement, M.D.

At Mary Imogene Bassett Hospital:**ASSOCIATE PROFESSORS OF CLINICAL MEDICINE**

John S. Davis, M.D.
 Herbert J. Marx, M.D.

ASSOCIATE CLINICAL PROFESSOR

Joseph W. Ferrebee, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Emery C. Herman, M.D.
 William H. Mook, M.D.

Medicine (continued)**ASSISTANT PROFESSORS OF CLINICAL MEDICINE (continued)**

Alan G. Ramsay, M.D.
Robert S. Sioussat, M.D.
David W. Vaules, M.D.

ASSISTANT CLINICAL PROFESSORS

Joseph S. Lunn, M.D.
Donald O. Pollack, M.D.

ASSOCIATE

Theodore Peters, Jr., PH.D.
(from Biochemistry)

INSTRUCTORS

Walter Franck, M.D.
Yoshiro Matsuo, M.D.
James L. Schaepe, M.D.
David S. Svahn, M.D.

At Harlem Hospital:**PROFESSOR**

Gerald E. Thomson, M.D.

ASSOCIATE PROFESSORS

Yale Enson, M.D.
John Lindenbaum, M.D.
Dudley F. Rochester, M.D.

ASSOCIATE PROFESSOR OF CLINICAL MEDICINE

Charles Felton, M.D.

ASSOCIATE CLINICAL PROFESSORS

John B. Cromie, M.D.
William R. Cunnick, M.D.
John R. Edsall, M.D.
Cecil G. Marquez, M.D.
Kenneth Sterling, M.D.
Charles M. Yergan, M.D.

ASSISTANT PROFESSORS

Anne M. Briscoe, PH.D.
Roger J. Lewis, M.D.
Clayton L. Natta, M.D.
(Pathology)

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Margaret M. Kilcoyne, M.D.
Jeannette A. Smith, M.D.

ASSISTANT CLINICAL PROFESSORS

Harold S. Ballard, M.D.
George C. Branche, M.D.
Albert R. Casazza, M.D.
Milena L. Lewis, M.D.
Richard R. Prouty, M.D.
Lewis M. Slater, M.D.

ASSOCIATES

Marcia B. Bull, M.D.
John C. DiJohn, M.D.
Pearl D. Foster, M.D.

Paul Killian, M.D.

Anthony J. Marano, M.D.
Lee B. Reichman, M.D.

INSTRUCTORS

Elmer Alpert, M.D.
Vernon G. Baker, M.D.
Mack Bonner, Jr., M.D.
Norma Braun, M.D.
Jay Brown, M.D.
James T. T. Chien, M.D.
Ernest J. DeSalvo, M.D.
James H. Habert, M.D.
John Preston Jenkins, M.D.
Clarence S. Murray, M.D.
Michael D. Williams, M.D.

ASSISTANTS

Philip T. Infantolino, M.D.
Reynard J. McDonald, M.D.
Douglas Miller, M.D.
Nely Saturno Recano, M.D.
Warren T. Sherman, M.D.

LECTURER

Gerald L. Baum, M.D.

At Roosevelt Hospital:**PROFESSORS**

Nicholas P. Christy, M.D.
Gerald B. Phillips, M.D.

CLINICAL PROFESSOR

Philip H. Henneman, M.D.

ASSOCIATE PROFESSORS

A. Gregory Jameson, M.D.
William Rosner, M.D.
Harvey J. Weiss, M.D.

ASSOCIATE PROFESSOR OF CLINICAL MEDICINE

Michael H. Grieco, M.D.

ASSOCIATE CLINICAL PROFESSORS

Kenneth T. Donaldson, M.D.
Frank E. Iaquinata, M.D.
(Public Health)

ASSISTANT PROFESSORS

Edward M. Dwyer, III, M.D.
Marianne J. Legato, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Albert Attia, M.D.
Henry G. Schaffeld, M.D.
Joyce C. Shaver, M.D.

ASSISTANT CLINICAL PROFESSORS

Richard Amcs, M.D.
LeClair Bissell, M.D.
Earl B. Brown, M.D.
Stanley R. Fine, M.D.
Leo B. Halleran, M.D.
Myron C. Patterson, M.D.
Bruce H. Pinkernell, M.D.
Lawrence Scharer, M.D.

ASSOCIATES

Harvey Benovitz, M.D.
Robert Bernot, M.D.
Charles A. Bertrand, M.D.
James Ducey, M.D.
James B. Gabriel, M.D.
Arthur Karanas, M.D.
Jacob D. Matis, M.D.
David K. Meriney, M.D.
Nicholas V. Steiner, M.D.
Gerald Weintraub, M.D.
Herman Ziffer, M.D.

RESEARCH ASSOCIATE

Thomas B. Tschopp, M.D.

INSTRUCTORS

Kenneth A. Altman, M.D.
Susan M. Deakins, M.D.
Rosina B. Dixon, M.D.
Robert K. Emy, M.D.
Oscar B. Garfein, M.D.
Carolyn E. Goodstein, M.D.
Henry M. Greenberg, M.D.
Wendy A. Gross, M.D.
Antoine C. Harovas, M.D.
Annetta J. Kimball, M.D.
Edith Joan Langer, M.D.
Thomas M. Nall, M.D.
John J. Olichrey, M.D.
Robert B. Tator, M.D.
Thornton S. Walker, M.D.

ASSISTANTS

Michael A. Diamond, M.D.
William M. Nicholas, M.D.

At St. Luke's Hospital:**PROFESSOR**

Theodore B. Van Itallie, M.D.

ASSOCIATE PROFESSORS

John F. Bertles, M.D.
Robert B. Case, M.D.
Peter R. Holt, M.D.

ASSOCIATE PROFESSOR OF CLINICAL MEDICINE

A. L. Loomis Bell, M.D.

ASSOCIATE CLINICAL PROFESSORS

William S. Clark, M.D.
James G. Hilton, M.D.

SENIOR RESEARCH ASSOCIATE

Beatrice M. Fairchild, PH.D.

ASSISTANT PROFESSORS

Robert S. Bernstein, M.D.
Paul Cushman, M.D.
Richard N. Pierson, M.D.
F. Xavier PiSunyer, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE

Judith Axelrod, M.D.
Harvey G. Kemp, M.D.

ASSISTANT PROFESSORS OF CLINICAL MEDICINE (*continued*)

Alice Maniatis, M.D.
Norton S. Rosensweig, M.D.

ASSISTANT CLINICAL PROFESSORS

Robert S. Beekman, M.D.
David S. David, M.D.
Zane H. Gaut, M.D.
Jonas M. Goldstone, M.D.
John H. Keating, Jr., M.D.
Edward H. Reisner, M.D.
Miles J. Schwartz, M.D.
Myron Wright, M.D.

ASSOCIATES

Charles G. Adsit, M.D.
William P. Athos, M.D.
C. Reddington Barrett, M.D.
Airlee A. C. Cameron, M.D.
Donald P. Dallas, M.D.
George Dermksian, M.D.
James A. Feltman, M.D.
Francis G. Geer, M.D.
Maurice F. Goodbody, M.D.
William S. Hopewell, M.D.
Arthur J. Lennon, M.D.
Richard S. McCray, M.D.
Robert B. Roven, M.D.
Seiichi Shimomura, M.D.
Thomas T. Tamlyn, M.D.

RESEARCH ASSOCIATES

Ting I. Li, M.D.
William N. Poillon, M.D.
Paul H. Swerdlow

INSTRUCTORS

Eric Andreae, M.D.
Cecil B. Broderick, M.D.
Hugh C. Davidson, M.D.
Dulaney Glen, M.D.

Microbiology**PROFESSORS**

Paul D. Ellner, PH.D.
Bernard F. Erlanger, PH.D.
Charles L. Fox, M.D.
(Surgery)
Harold S. Ginsberg, M.D.
(Chairman)
Gabriel C. Godman
(See Pathology)
Donald H. Harter, M.D.
Elvin A. Kabat, PH.D.
(Neurology)
Councilman Morgan, M.D.
(Associate Dean)
Harry M. Rose, M.D.
(Borne Professor)
Herbert S. Rosenkranz, PH.D.
Henry J. Vogel, PH.D.
(Pathology)

ASSOCIATE PROFESSOR

Wladyslaw Manski, SC.D.
(Ophthalmology)

ASSISTANT PROFESSORS

Joe E. Coward, PH.D.
Dean L. Engelhardt, PH.D.
Tadasu Tokumaru, M.D.
(Ophthalmology)
Spyros M. Vratsanos, PH.D.

RESEARCH ASSOCIATES

John Ormond Cisar, PH.D.
Iris L. Doerr, PH.D.
Eugenia T. Gamboa, PH.D.
(Neurology)
Miercio E. Alves Pereira, M.D.
Norbert Wassermann, ENG.D.

SPECIAL LECTURERS

Konrad C. Hsu, PH.D.
Beatrice C. Seegal, M.D.

At Harlem Hospital:**ASSISTANT PROFESSOR**

Angus C. Sampath, D.SC.
(Pathology)

At Roosevelt Hospital:**ASSISTANT PROFESSOR**

Azra Shahidi, PH.D.

RESEARCH ASSOCIATE

Israel Siegel, PH.D.

Neurological Surgery**PROFESSORS OF CLINICAL NEUROLOGICAL SURGERY**

Lester A. Mount, M.D.
Edward B. Schlesinger, M.D.
(Stookey Professor and Chairman)

ASSOCIATE PROFESSORS OF CLINICAL NEUROLOGICAL SURGERY

James W. Correll, M.D.
Edgar Housepian, M.D.
James G. McMurtry, M.D.

ASSISTANT PROFESSORS OF CLINICAL NEUROLOGICAL SURGERY

Thomas J. Bridges, M.D.
Peter W. Carmel, M.D.

ASSOCIATES

W. Jost Michelsen, M.D.
Harvey R. Nova, M.D.

RESEARCH ASSOCIATE

Gerda G. Mayer, PH.D.

INSTRUCTORS

George L. Becker, Jr., M.D.
Ronald Brisman, M.D.

At Mary Imogene Bassett Hospital:**ASSISTANT CLINICAL PROFESSOR**

Robert W. Mackie, M.D.

At Harlem Hospital:**ASSOCIATES**

Henry D. Messer, M.D.
Richard B. Raynor, M.D.

At St. Luke's Hospital:**ASSISTANT CLINICAL PROFESSOR**

Robert W. Schick, M.D.

ASSOCIATE

James E. O. Hughes, M.D.

Neurology**PROFESSORS**

Sidney Carter, M.D.
Roger C. Duvoisin, M.D.
Stanley Fahn, M.D.
Sid Gilman, M.D.
Eli S. Goldensohn, M.D.
Donald H. Harter, M.D.
Richard L. Masland, M.D.
(Moses Professor)
Lewis P. Rowland, M.D.
(Chairman)

PROFESSORS OF CLINICAL NEUROLOGY

Daniel Sciarra, M.D.
Carmine T. Vicale, M.D.

ASSOCIATE PROFESSORS

Lucien Cote, M.D.
Arthur Karlin, PH.D.
(from Physiology)
Leon T. Kremzner, PH.D.
(Neurochemistry)
Robert E. Lovelace, M.D.
Audrey S. Penn, M.D.
John P. Reuben, PH.D.
(Physiology)

ASSOCIATE PROFESSORS OF CLINICAL NEUROLOGY

Abe Chutorian, M.D.
(Pediatrics)
Arnold P. Gold, M.D.
(Pediatrics)
James F. Hammill, M.D.

ASSOCIATE CLINICAL PROFESSORS

Joseph G. Chusid, M.D.
Niels L. Low, M.D.
(Pediatrics)
Rita G. Rudel, PH.D.
(Medical Psychology)
Samuel F. Thomas, M.D.

SENIOR RESEARCH ASSOCIATE

George M. Katz, B.E.E.

ASSISTANT PROFESSORS

Robert E. Barrett, M.D.
M. Richard Koenigsberger, M.D.
(Pediatrics)

Neurology (continued)

ASSISTANT PROFESSORS

(continued)

Terrone L. Rosenberry, PH.D.
(from Biochemistry)
Earl A. Zimmerman, M.D.

ASSISTANT PROFESSORS OF CLINICAL
NEUROLOGY

Robert A. deNapoli, M.D.
William Isgreen, M.D.
Joseph L. O'Brien, M.D.
Margaret R. Seiden, M.D.

ASSISTANT CLINICAL PROFESSORS

Jason W. Brown, M.D.
Hyman G. Weitzen, M.D.

ASSOCIATES

Frank K. Boschenstein, M.D.
Sidney M. Cohen, M.D.
James F. Culleton, M.D.
Martha B. Denckla, M.D.
Stanley W. Holstein, M.D.
Stanley Lesse, M.D.
Geoffrey F. Osler, M.D.
David L. Sagman, M.D.

RESEARCH ASSOCIATES

Hai Won Chang, PH.D.
Eugenia T. Gamboa
(Microbiology)
Masataka Kawai, PH.D.
Mary W. Masland, M.S.
(from Otolaryngology)
Shiro Mawatari, M.D.
Mark G. McNamee, M.D.
William D. Niemi, PH.D.
Morton Orentlicher, PH.D.
Charles E. Pippenger, PH.D.
A. L. N. Prasad, PH.D.
Sidney Steinberg, B.A.
I. M. Tarlov, M.D.
Cheryl L. Weill

INSTRUCTORS

V. John Blazina, M.D.
Sarala A. Devi, M.B.
Robert A. Esser, M.D.
Edward J. Hart, M.D.
Linda Lewis, M.D.
Sang C. Rhee, M.D.
Michael Sananman, M.D.

SPECIAL LECTURERS

Harry Grundfest, PH.D.
David Nachmansohn, M.D.
(from Biochemistry)

LECTURERS

Florry Bowen, PH.D.
Arnold Friedman, M.D.
Sara Ginsburg, PH.D.
Alexander Mauro, PH.D.

At Mary Imogene Bassett Hospital:

ASSOCIATE CLINICAL PROFESSOR

William Amols, M.D.

At Harlem Hospital:

ASSOCIATE PROFESSOR OF CLINICAL
NEUROLOGY

Ralph W. Richter, M.D.

ASSISTANT CLINICAL PROFESSOR

John C. M. Brust, Jr., M.D.

ASSOCIATE

Bertel Bruun, M.D.

INSTRUCTORS

Peggy Ann Alsup, M.D.
Alfred C. Bannerman, M.D.

ASSISTANT

Dora H. Schively, M.D.

At St. Luke's Hospital:

ASSOCIATE

Carl W. Braun, M.D.

INSTRUCTOR

Sidney E. Bender, M.D.

Nursing

PROFESSORS

Mary I. Crawford, ED.D.
(Chairman)
Helen F. Pettit, M.A.
(Assistant Dean)

ASSOCIATE PROFESSORS

Constance P. Cleary, M.A.
Anna M. Earle, ED.D.

ASSOCIATE PROFESSOR OF
CLINICAL NURSING

Elsa Poslusny, M.A.

ASSISTANT PROFESSORS

Mary R. Barone, M.A.
Ellen R. Batt, M.A.
Marjorie A. Bredice, M.S.
Elizabeth W. Carter, M.A.
Bernice R. Derby, M.S.
Virginia Ehmann, M.A.
Charmaine McM. Fitzig, B.S.
Keville M. Frederickson, B.S.
Linda K. Hamlin, M.S.
Rose M. Hoynak, M.A.
Linbania Jacobson, M.S.
Fern Kumler, M.S.
Eara M. Lennon, M.S.
Jane F. McConville, M.A.
Elizabeth A. Mahoney, M.A.
Eunice Messler, M.A.

Mary E. Windrow, M.A.
Edwin O. Wray, M.A.

ASSISTANT PROFESSORS OF CLINICAL
NURSING

Carole A. Kaufmann, M.S.
Constance B. Ort, M.A.
Loretta A. Verdisco, M.A.

DIRECTOR OF ADMISSIONS

Elin B. Ozdemiv, M.S.

DIRECTOR OF RESIDENCE

Rosemary L. Ash, M.A.

ASSISTANT DIRECTOR OF RESIDENCE

Nancy K. Charles, B.S.

ASSOCIATES

Patricia Blagman, M.S.
Beverly A. Capaccio, M.S.
Margaret A. Kelley, M.S.
Anne E. Kellett, M.A.
Irene C. McEachen, M.S.
Jeanne B. Murray, M.S.
Grace M. Nespoli, M.S.
Smitri Pawar, M.A.
Mary M. Robertson, M.A.
Margarete J. Sandelowski, M.S.
Bonita P. Schulze, M.A.
Lillie M. Shortridge, M.S.
Mary V. Smith, M.A.
Aurora D. Villafuerta, M.S.
Lucy D. Warren, M.A.
Elizabeth B. Zdibak, M.S.

RESEARCH ASSOCIATES

Bettie S. Jackson, M.A.
Patricia K. Kaelin, M.S.

INSTRUCTORS

Doris Barker, B.S.
Patricia A. Beaulieu, B.A.

INSTRUCTORS

Beth E. Berman, M.A.
Mary I. Brooks, B.S.
Elinor Buchbinder, M.A.
Christine M. Butler, M.S.
Pamela J. Dadac, B.S.
Carol J. Foy, M.A.
Karin E. Freas Gapper, M.A.
Mary M. Ho, M.A.
Muriel F. Kneeshaw, B.S.N.
Pauline Krajewski, M.A.
Melvina J. Lohmann, M.S.
Miriam A. McCormick, B.S.
Jane I. Mendleson, M.S.
Andrea J. Renovitch, M.S.
Suzanne M. Schimpeler, M.N.

At Harlem Hospital:

ASSISTANT PROFESSOR

Edith B. Benoit, M.A.
(Nursing Education)

Nursing (continued)**INSTRUCTORS**

Nancy C. Brown, M.A.
 Freda C. Bush, M.A.
 John A. Payne, M.A.
 (Psychiatry)
 Anna Stein, M.A.

At Roosevelt Hospital:**INSTRUCTORS**

Barbara A. Brennan, M.A.
 Jeanne Kobritz, M.S.
 Barbara A. Peterson, M.S.
 Eldra Simmons, M.A.

Obstetrics and Gynecology**PROFESSORS**

Georgiana Jagiello, M.D.
 (see Human Genetics and
 Development)
 Orlando J. Miller, M.D.
 Raymond L. Vande Wiele, M.D.
 (Rappleve Professor and
 Chairman)

**PROFESSORS OF CLINICAL OBSTETRICS
AND GYNECOLOGY**

Henry C. Frick, M.D.
 Equinn W. Munnell, M.D.
 Robert S. Neuwirth, M.D.
 Charles M. Steer, M.D.

ASSOCIATE PROFESSOR

Ines Mandl, PH.D.
 (Reproductive Biochemistry)

**ASSOCIATE PROFESSORS OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Robert E. Hall, M.D.
 W. Duane Todd, M.D.
 Gilbert J. Vosburgh, M.D.
 Susan W. Williamson, M.D.

ASSOCIATE CLINICAL PROFESSORS

Vincent J. Freda, M.D.
 David B. Moore, M.D.

ASSISTANT PROFESSORS

Edward T. Bowe, M.D.
 Inge Dyrenfurth, M.D.
 Michel Ferin, M.D.
 (Physiology)
 Wylie Hembree, M.D.
 (see Medicine)
 Raphael Jewelewicz, M.D.
 Roy H. Petrie, M.D.
 Pedro Rosso, M.D.
 (Pediatrics)

**ASSISTANT PROFESSORS OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Solan Chao, M.D.
 Harold Speert, M.D.

ASSISTANT CLINICAL PROFESSORS

Dean J. Grandin, M.D.
 Raymond M. McCaffrey, M.D.
 Anne B. Pierson, M.D.
 Wolfgang Tretter, M.D.

ASSOCIATES

Fleming Wollesen, M.D.
 Ming-Neng Yeh, PH.D.

RESEARCH ASSOCIATES

Lajos Bandy, M.S.
 Carlton E. Blackwood, PH.D.
 Steve N. Caritis, M.D.
 Fred Chasalow, PH.D.
 Richard Hochberg, PH.D.
 Stanley Jay Jasne, M.D.
 Stephen Keller, PH.D.
 Shoshany Ladany, M.D.
 Violet Lippman, M.D.
 Paula E. Zimmering, PH.D.
 (from Biochemistry)

LECTURERS

Hussein K. Amin, M.B.
 Arnold N. Fenton, M.D.
 John L. Lewis, Jr., M.D.
 Anna L. Southam, M.D.
 Christopher Tietze, M.D.

At Mary Imogene Bassett Hospital:**ASSISTANT CLINICAL PROFESSORS**

Richard A. Andresen, M.D.
 Douglas H. Barns, M.D.

**INSTRUCTOR IN CLINICAL
OBSTETRICS AND GYNECOLOGY**

Balazs Selendy, M.D.

At Harlem Hospital:**ASSOCIATE PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Hiroko T. Felton, M.D.

ASSISTANT PROFESSOR

Trishit K. Mukherjee, M.D.

**ASSISTANT PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Meredith Sirmans, M.D.

ASSISTANT CLINICAL PROFESSORS

Sunthorn Bunyaviroch, M.D.
 Stephen L. Matseoane, M.D.

INSTRUCTORS

Hasi Das, M.D.
 Nomenida A. Lazaro, M.D.
 Noel D. Mohammed, M.D.
 Ester S. Suarez, M.D.
 Pisan Unchalipongse, M.D.
 Alfred J. Williams, M.D.

At Roosevelt Hospital:**PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Thomas F. Dillon, M.D.

**ASSOCIATE PROFESSORS OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

John F. Dwyer, M.D.
 Terusada Horiguchi, M.D.
 Abraham Risk, M.D.

ASSISTANT PROFESSOR

Muriel Feigelson, PH.D.
 (Biochemistry)

**ASSISTANT PROFESSORS OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Ernst G. Bartsich, M.D.
 Marcia L. Storch, M.D.

ASSISTANT CLINICAL PROFESSORS

Margot Ammann, M.D.
 Irwin Chabon, M.D.
 Alexander Coman, M.D.
 David B. Crawford, M.D.
 Anevar Hanania, M.D.
 Ivan Jacobson, M.D.
 Barbara J. Logan, M.D.
 Heinz L. Luchinsky, M.D.
 Riley W. Waller, M.D.

ASSOCIATE

Fouad Surur, M.B.

RESEARCH ASSOCIATES

Madhu M. Bhargava, M.D.
 Coral A. Lamartiniere, M.D.
 Ingrid G. Noske, M.D.

INSTRUCTORS

Bernardo Handszer, M.D.
 Carmine Spedaliere, M.D.

At St. Luke's Hospital:**PROFESSOR OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Harold M. M. Tovell, M.D.

**ASSISTANT PROFESSORS OF CLINICAL
OBSTETRICS AND GYNECOLOGY**

Tawfik H. Rizkallah, M.D.
 Lajos I. von Micsky, M.D.

ASSISTANT CLINICAL PROFESSOR

Ian G. Van Praagh, M.D.

INSTRUCTORS

Gerard de Catalogne, M.D.
 Alberto Mario Lomeo, M.D.
 Gyula Nemes, M.D.
 Adamandia G. Panayotopoulos, M.D.

Ophthalmology**PROFESSORS**

Arthur Gerard DeVoe, M.D.
 (Harkness Professor and
 Chairman)

Ophthalmology (continued)**PROFESSORS OF CLINICAL OPHTHALMOLOGY**

Charles J. Campbell, M.D.
Philip Knapp, M.D.
George R. Merriam, M.D.

CLINICAL PROFESSORS

Robert M. Day, M.D.
Ira S. Jones, M.D.

ASSOCIATE PROFESSORS

Kenneth E. Eakins, PH.D.
Takeo Iwamoto, M.D.
Wladyslaw Manski, D.SC.
(from Microbiology)
Paul Witkovsky, PH.D.
(from Physiology)

ASSISTANT PROFESSORS

Laszlo Z. Bito, PH.D.
Hernando Cardona, M.D.
Jorge Fischbarg, PH.D.
Joe G. Hollyfield, PH.D.
Lu-Ku Li, PH.D.
Victoria Ozanics, M.S.
Tadasu Tokumaru, M.D.
(from Microbiology)

ASSISTANT PROFESSORS OF CLINICAL OPHTHALMOLOGY

William C. Cooper, M.D.
Andrew deRoeth, Jr., M.D.
Anthony Donn, M.D.
Robert M. Ellsworth, M.D.
John W. Espy, M.D.
Max Forbes, M.D.
Arnold W. Forrest, M.D.
George M. Howard, M.D.
Francis L'Esperance, M.D.
Harold F. Spalter, M.D.

ASSISTANT CLINICAL PROFESSOR

Ellen F. Regan, M.D.

ASSOCIATES

D. Jackson Coleman, M.D.
Richard W. Darrell, M.D.
R. Linsy Farris, M.D.
Frank B. Hoefle, M.D.
Hugh Moss, M.D.
Stephen L. Trokel, M.D.
Emil Wirosko, M.D.

RESEARCH ASSOCIATES

Ethel L. Anderson, PH.D.
John H. Chen, M.D.
Milton M. Kaplan, D. OPTOM.
(Physiological Optics)
Kazimierz C. Malinowski, PH.D.
Sally Moore, M.S.
V. L. N. Murty, PH.D.
(Biochemistry)
Debutta Roy, PH.D.

INSTRUCTOR

Myles M. Behrens, M.D.

ASSISTANTS

Richard D. Banyard, M.D.
Milton F. Campbell, M.D.
William A. James, Jr., M.D.
Richard G. Lennon, M.D.
Lance D. Redler, M.D.
Balachandran D. Srinivasan, M.D.
Thaddeus L. Wandel, M.D.

SPECIAL LECTURERS

Gordon M. Bruce, M.D.
Frank D. Carroll, M.D.
Zacharias Dische, M.D.
(from Biochemistry)
M. Catherine Rittler, B.A.

LECTURER

Charles J. Koester, PH.D.

At Harlem Hospital:

ASSOCIATE

Herman C. Jordan, M.D.

At St. Luke's Hospital

ASSISTANT PROFESSOR OF CLINICAL OPHTHALMOLOGY

James C. Newton, M.D.

Orthopedic Surgery**PROFESSORS**

C. Andrew L. Bassett, M.D.
Frank E. Stinchfield, M.D.
(Chairman)

PROFESSORS OF CLINICAL ORTHOPEDIC SURGERY

Robert E. Carroll, M.D.
Alexander Garcia, M.D.
Charles S. Neer, II, M.D.
Charles T. Ryder, M.D.

ASSOCIATE PROFESSOR

Austin D. Johnston, M.D.
(from Pathology)

ASSOCIATE PROFESSORS OF CLINICAL ORTHOPEDIC SURGERY

George B. Ambrose, M.D.
Sawnie R. Gaston, M.D.
S. Ashby Grantham, M.D.

ADJUNCT ASSOCIATE PROFESSOR

Arthur A. Pilla, PH.D.
(Chemical Engineering)

ASSISTANT PROFESSORS OF CLINICAL ORTHOPEDIC SURGERY

David L. Andrews, M.D.
Harold M. Dick, M.D.
Nasseroddin S. Eftekhari, M.D.
Hugo A. Keim, M.D.

ASSISTANT CLINICAL PROFESSORS

Everett C. Bragg, M.D.
Rosamond Kane, M.D.
D. Keith McElroy, M.D.
Robert M. Reiss, M.D.

ASSISTANT PROFESSOR OF ANATOMY

Robert W. Rice, PH.D.

INSTRUCTORS

Peter N. Carbonara, M.D.
William U. Cavallaro, M.D.
Chauncey H. Dobson, M.D.
Richard L. Fenton, M.D.
William G. Hamilton, M.D.
Merle H. Katzman, M.D.
Abraham C. Kovarsky, M.D.
Harvey Orlin, M.D.
Joseph E. Salvatore, M.D.
L. Arne Skilbred, M.D.
David M. Smith, M.D.
Martin L. Sorger, M.D.
Joel D. Weinstein, M.D.
Eric K. Zitzmann, M.D.

At Harlem Hospital:

ASSOCIATE PROFESSOR OF CLINICAL ORTHOPEDIC SURGERY

Marvin L. Shelton, M.D.

ASSOCIATE

Aaron Gold, M.D.

At New York State Rehabilitation Hospital:

ASSOCIATE CLINICAL PROFESSOR

Alice L. Garrett, M.D.

ASSISTANT CLINICAL PROFESSORS

Edward B. Leahey, M.D.
Edward M. Wheeler, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSOR

Andrew L. Patterson, M.D.

INSTRUCTORS

James C. Parkes, M.D.
William A. Sinton, M.D.

At St. Luke's Hospital:

PROFESSOR OF CLINICAL ORTHOPEDIC SURGERY

Joseph W. Fielding, M.D.

Otolaryngology**PROFESSORS**

Daniel C. Baker, Jr., M.D.
(Chairman)
Juergen Tonndorf, M.D.

PROFESSORS OF CLINICAL OTOLARYNGOLOGY

Milos Bascik, M.D.
Robert M. Hui, M.D.
Jules G. Waltner, M.D.

PROFESSOR OF CLINICAL AUDIOLOGY
AND SPEECH PATHOLOGY

Thomas H. Fay, PH.D.

CLINICAL PROFESSOR

John J. Conley, M.D.

ASSOCIATE PROFESSOR

Shyam M. Khanna, D.R.E.

ASSOCIATE PROFESSOR OF
CLINICAL OTOLARYNGOLOGY

Robin M. Rankow, M.D.

ASSOCIATE CLINICAL PROFESSOR

Malcolm H. Schvey, M.D.

ASSISTANT PROFESSORS OF CLINICAL
OTOLARYNGOLOGY

Olaf Haroldson, Jr., M.D.

Frank V. Mignogna, M.D.

Lawrence Savetsky, M.D.

ASSISTANT CLINICAL PROFESSORS

Robert C. Eberle, M.D.

John D. Piro, M.D.

(Prosthetics)

ASSOCIATE

Raymond M. Cole, M.D.

RESEARCH ASSOCIATE

Mary W. Masland, M.S.

INSTRUCTORS

Neville W. Carmical, M.D.

Claudio Crupi, M.D.

Ivo P. Janecka, M.D.

John Palesty, M.D.

Raymond B. Strauss, M.D.

Peter D. Westerhoff, M.D.

Howard D. Zipper, M.D.

At Mary Imogene Bassett Hospital:

ASSOCIATE

William V. Reynolds, M.D.

At Harlem Hospital:

ASSOCIATE CLINICAL PROFESSOR

Errol A. Thompson, M.D.

ASSISTANT PROFESSOR OF SPEECH
AND HEARING

Raphael M. Haller, M.D.

ASSOCIATE

Mehdi Shaari-Tehrani, M.D.

At Roosevelt Hospital:

ASSOCIATE CLINICAL PROFESSOR

John S. Lewis, M.D.

At St. Luke's Hospital:

ASSOCIATE CLINICAL PROFESSOR

Stanley Whitfield, M.B.

INSTRUCTOR

Mauriciu Rodescu, M.D.

Pathology

PROFESSORS

William A. Blanc, M.D.

A. Whitley Branwood, M.D.

David Cowen, M.D.

(Neuropathology)

Philip E. Duffy, M.D.

(Neuropathology)

S. Raymond Gambino, M.D.

Gabriel Godman, M.D.

Donald W. King, M.D.

(Delafield Professor and
Chairman)

Nathan Lane, M.D.

(Surgical Pathology)

Raffaele Lattes, M.D.

(Surgical Pathology)

Conrad L. Pirani, M.D.

Ralph M. Richart, M.D.

(Obstetrics and Gynecology)

Leon Roizin, M.D.

(Neuropathology—from
Psychiatry)

Henry J. Vogel, PH.D.

(from Microbiology)

CLINICAL PROFESSORS

John G. Gorman, M.D.

Victor Herbert, M.D.

Lewis Shapiro, M.D.

(Dermatology)

Sheldon C. Sommers, M.D.

Bernard M. Wagner, M.D.

ADJUNCT PROFESSORS

Harry L. Joachim, M.D.

Sidney Pestka, M.D.

ASSOCIATE PROFESSORS

Arline D. Deitch, M.D.

Ross M. Grey, D.V.M.

(Comparative Pathology)

Austin D. Johnston, M.D.

(Orthopedic Surgery)

Mavis Kaufman, M.D.

(Neuropathology—Psychiatry)

Gordon I. Kaye, PH.D.

(Surgical Pathology)

Robert Pascal, M.D.

Karl Perzin, M.D.

(Surgical Pathology)

Myron Tannenbaum, M.D.

(Urology)

Virginia M. Tennyson, PH.D.

(Neuropathology)

Ruth H. Vogel, M.D.

H. Joachim Wigger, M.D.

(Pediatrics)

Marianne Wolff, M.D.

(Surgical Pathology)

ASSOCIATE CLINICAL PROFESSORS

Irwin A. Almenoff, M.D.

Daniel W. Benninghoff, M.D.

Melvin W. Blake, M.D.

(Oral Pathology)

Donald E. Brown, M.D.

John M. Budinger, M.D.

Robert L. Hirsch, M.D.

Stanley S. Simbonis, M.D.

Harold J. Sobel, M.D.

Richard L. Swarm, M.D.

Myron E. Tracht, M.D.

ADJUNCT ASSOCIATE PROFESSORS

Ernest Baden, M.D.

Harry H. Stumpf, M.D.

Frederick T. Zugibe, M.D.

ASSISTANT PROFESSORS

Thomas A. Blumenfeld, M.D.

(Pediatric Pathology)

Richard F. Defendini, M.D.

(Neuropathology)

John J. Fenoglio, M.D.

Joshua Fierer, M.D.

Robert Galen, M.D.

Liselotte Graf, M.D.

Lewis A. Johnson, M.D.

Mary E. King, M.D.

William L. McLellan, PH.D.

Nicole Suciu-Foca, M.D.

Philip Tomashefsky, PH.D.

(Urology)

George D. Wilner, M.D.

David J. Zegarelli, D.D.S.

ASSISTANT CLINICAL PROFESSORS

Giles G. Allard, M.D.

Lucretia Allen, M.D.

Ada B. de Chabon, M.D.

Stefan E. Epstein, M.D.

Don V. Hellerman, M.D.

Hiroshi Nakazawa, M.D.

M. Richard Pachter, M.D.

William Pollack, PH.D.

Henry G. Schriever, M.D.

Ralph W. Snyder, M.D.

John A. Terzakis, M.D.

Paul T. Wertlake, M.D.

Kaity Yannopoulos, M.D.

ADJUNCT ASSISTANT PROFESSORS

Paul Bachner, M.D.

Glenna J. Conley, M.D.

Reba M. Goodman, M.D.

Arthur L. Hurvitz, M.D.

Catherine Kambolis, M.D.

Basil Moumgis, M.D.

ASSOCIATES

Herbert Barden

(Neuropathology)

Alvin J. Marx, M.D.

RESEARCH ASSOCIATES

Neville Colman, PH.D.

Vijaya M. Ghanta, PH.D.

Pathology (continued)**RESEARCH ASSOCIATES
(continued)**

Elizabeth Jacob, PH.D.
Margaret E. Long, PH.D.
Thomas S. Mao, PH.D.
Kokila Majund Mody, PH.D.
Mary S. Parshley, PH.D.
Moshe Rosen, PH.D.
Elo Urm, M.D.

INSTRUCTORS

Solange G. Abu Nassar, M.D.
Cecilia M. Fenoglio, M.D.
Gifford Y. Y. Lum, M.D.
Mark R. Mankoff, M.D.
Robert D. Newman, M.D.
Joseph E. O'Brien, M.D.
Milagros Ora-Sarino, M.D.
Joel A. Roth, M.D.

SPECIAL LECTURERS

Lester Cahn, D.D.S.
Jacob Furth, M.D.
C. Zent Garber, M.D.
Abner Wolf, M.D.
(Neuropathology)

LECTURERS

Hyman Donnenfeld, M.D.
Janis V. Klavins, M.D.
David Spain, M.D.

At Mary Imogene Bassett Hospital:**CLINICAL PROFESSOR**

Clinton Van Z. Hawn, M.D.

ASSOCIATE CLINICAL PROFESSOR

Charles A. Ashley, M.D.

At Francis Delafield Hospital:**RESEARCH ASSOCIATE**

Thomas S. Mao, PH.D.

At Harlem Hospital:**CLINICAL PROFESSOR**

Theophilus Roberts, M.D.

ASSOCIATE PROFESSOR

Jack W. C. Hagstrom, M.D.

ASSISTANT PROFESSORS

Prem Chauhan, M.D.
Azak S. Eryol, M.D.
Carlos Navarro, M.D.
Angus C. Sampath, D.Sc.
(from Microbiology)

ASSISTANT CLINICAL PROFESSOR

Mathieu A. Seide, M.D.

RESEARCH ASSOCIATE

Charles Robert Plank, M.D.

ASSOCIATE

John C. Wu, M.D.

INSTRUCTORS

Luritz C. Creque, M.D.
Gerda E. Nette, M.D.
Noel N. Weekes, M.D.

At Roosevelt Hospital:**CLINICAL PROFESSOR**

Rudolf Garret, M.D.

ASSOCIATE CLINICAL PROFESSORS

John T. Kiyasu, M.D.
Louise L. Phillips, M.D.

ASSISTANT CLINICAL PROFESSORS

Lazareviov Bozidar, M.D.
John J. Di Re, M.D.
Sanford M. Farrer, M.D.
Martin S. Krumerman, M.D.

At St. Luke's Hospital:**CLINICAL PROFESSOR**

Charles F. Begg, M.D.

ASSISTANT CLINICAL PROFESSORS

Harold P. Gaetz, M.D.
Artemis D. Nash, M.D.
Stephen Ryan, M.D.

INSTRUCTORS

Petra E. P. Banogon, M.D.
Kendall K. Kane, M.D.
Corazon S. Sian, M.D.

Pediatrics**PROFESSORS**

Richard E. Behrman, M.D.
(Chairman)
Edward C. Curnen, Jr., M.D.
(Carpentier Professor)
H. Donald Dunton, M.D.
L. Stanley James, M.D.
(Anesthesiology)
George I. Lythcott, M.D.
(Associate Dean)
Myron Winick, M.D.
(Director of Institute of
Human Nutrition)
Robert W. Winters, M.D.
James A. Wolff, M.D.

ADJUNCT PROFESSOR

Michael Lewis, PH.D.
(Pediatric Psychology)

ASSOCIATE PROFESSORS

Jo Anne Brasel, M.D.
Ralph Dell, M.D.
Welton M. Gersony, M.D.
Allen I. Hyman, M.D.
Gilbert W. Mellin, M.D.
Robert B. Mellins, M.D.
Akira Morishima, M.D.
John F. Nicholson, M.D.
David Rush, PH.D.
(Public Health)
Katherine Sprunt, M.D.

**ASSOCIATE PROFESSORS OF CLINICAL
PEDIATRICS**

Carolyn R. Denning, M.D.
Susan G. Gordon, M.D.
Sylvia P. Griffiths, M.D.
Ruth C. Harris, M.D.

ASSOCIATE CLINICAL PROFESSORS

William A. Bauman, M.D.
Solomon J. Cohen, M.D.
Douglas S. Damrosch, M.D.
Jerry C. Jacobs, M.D.
Chris P. Katsampes, M.D.
Walter R. Kessler, M.D.

ASSISTANT PROFESSORS

Russell S. Asnes, M.D.
Jennifer J. Bell, M.D.
William J. Davis, M.D.
Catherine DeAngelis, M.D.
John M. Driscoll, M.D.
Burton Grebin, M.D.
William C. Heird, M.D.
Leonard Indyk, PH.D.
(Medical Physics)
Eugene Klenk, M.D.
M. Richard Koenigsberger, M.D.
(from Neurology)
Ehud Krongrad, M.D.
Martin I. Lorin, M.D.
Jane Pitt, M.D.
Pedro Rosso, M.D.
Narayan R. Shah, M.D.
Anneliese L. Sitarz, M.D.
Carl N. Steeg, M.D.

**ASSISTANT PROFESSORS OF CLINICAL
PEDIATRICS**

Thomas A. Blumenfeld, M.D.
Pureza F. M. Gaerlan, M.D.
Constance J. Hayes, M.D.
Celia Ores, M.D.

ASSISTANT CLINICAL PROFESSORS

Robert E. Appleby, M.D.
Alexander Blum, Jr., M.D.
Joseph M. Bordini, M.D.
Matilda Brust, M.D.
Yvonne T. Driscoll, M.D.
Burton M. Feinsmith, M.D.
Bernard R. Feldman, M.D.
David N. Franklin, M.D.
Marguerite J. Gates, M.D.
Gustav Gavis, M.D.
Thurman B. Given, Jr., M.D.
Stephen Glaser, M.D.
Doris K. E. Goldberg, M.D.
I. Bruce Gordon, M.D.
Bertram H. Grossman, M.D.
Joseph E. Kalbacher, M.D.
John J. Kangos, M.D.
Dean N. Martin, M.D.
Armond V. Mascia, M.D.
Shirley A. Mayer, M.D.
Daniel J. Melia, M.D.
Anthony B. Minnefor, M.D.

ASSISTANT CLINICAL PROFESSORS (continued)

Walter L. Mitchell, M.D.
 Thomas W. Patrick, M.D.
 Herbert Poch, M.D.
 Morton H. Rachelson, M.D.
 Margaret Rice, M.D.
 Roderick C. Richards, M.D.
 Albert P. Rosen, M.D.
 Jack G. Shiller, M.D.
 Joseph A. Silverman, M.D.
 Gilbert Simon, M.D.
 William H. Smith, M.D.
 Walter R. Stankewick, M.D.
 David Stiles, M.D.
 Elizabeth Ufford, M.D.
 Martin B. Vita, M.D.
 Robert C. Wheeler, M.D.
 William W. Whitten, M.D.
 Leo Wilking, M.D.
 Preston Zucker, M.D.

ASSOCIATES

Rose G. Ames, M.D.
 Roger S. Challop, M.D.
 Ruth U. Donovan, M.D.
 T. Donald Eisenstein, M.D.
 Jane A. Erganian, M.D.
 Allan J. Hordof, M.D.
 Martin H. Jacobs, M.D.
 Irwin Mohr, M.D.
 Stanley Morrison, M.D.
 Louis Rodrigues, M.D.
 Robert M. Schwartz, M.D.
 Elizabeth F. Turnauer, M.D.

RESEARCH ASSOCIATES

William B. Bell, M.D.
 Duane W. Ebaugh, M.D.
 Chuck-Kwan Ketchum Lee, M.D.
 Grace A. Leidy, A.B.
 Enrique Massa, M.D.
 Werner Meier, M.D.
 Mario J. Merlino, M.D.
 Richard Polin, M.D.
 Tove Rosen, M.D.
 Raymond I. Stark, M.D.
 Nestor Trucione, M.D.

INSTRUCTORS

Martha L. Amarant, M.D.
 M. David Atkins, M.D.
 Solomon Chazen, M.D.
 John L. Costa, M.D.
 Elizabeth G. Estrin, M.D.
 Arlene Falk, M.D.
 Stanley H. Gilbert, Jr., M.D.
 Jeannette J. Jansky, M.S.
 Norman S. Katz, M.D.
 Betty C. M. L. Kuo, M.D.
 Sajid Maqbool, M.D.
 Joan W. Mathews, M.D.
 Margaret McHugh, M.D.
 Sylvia Morgan, M.D.
 Mary R. Richards, M.D.

Morton J. Seligman, M.D.
 Sheila A. Shanahan, M.D.
 Edith M. J. Kuo-Ying Shen, M.D.

ASSISTANTS

Alma T. Blitz, M.D.
 Bernard Etra, M.D.
 Matthew Feldman, M.D.
 Robert A. Herzlinger, M.D.
 Michael L. Lapkin, M.D.
 Carolkay Lissenden, M.D.
 Ruth D. Peters, M.D.
 Geoffrey P. Redmond, M.D.
 Rosalinda Rubinsztain, M.D.
 Gloria O. Schrager, M.D.
 Pradeep Sharma, M.D.
 Kung-tso Sheng, M.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSORS

Joe H. Cannon, M.D.
 Arthur E. Laidlaw, M.D.

ASSOCIATES

Allan S. Cunningham, M.D.
 John G. Freehafer, M.D.

At Harlem Hospital:

CLINICAL PROFESSORS

Erich J. Kahn, M.D.
 Calvin H. Sinnette, M.D.

ASSOCIATE PROFESSOR

Hugh E. Evans, M.D.

ASSOCIATE PROFESSORS OF CLINICAL PEDIATRICS

Leonard Glass, M.D.
 Wiener Le Blanc, M.D.

ASSOCIATE CLINICAL PROFESSOR

Gene Ann Polk, M.D.

ASSISTANT PROFESSOR

Vivian R. Iglehart, M.D.

ASSISTANT PROFESSORS OF CLINICAL PEDIATRICS

Jeanne E. Fenner, M.D.
 Yusaf M. Khahoo, M.D.

ASSISTANT PROFESSOR OF CLINICAL REHABILITATION MEDICINE

Lucille C. Gunning, M.D.

INSTRUCTORS

Dolores J. Gayle-Thompson, M.D.
 June Elsie Mulvaney, M.D.

ASSISTANT

Araceli R. Ancajas, M.D.

At Roosevelt Hospital:

PROFESSOR

Louis Z. Cooper, M.D.

ASSISTANT PROFESSOR OF CLINICAL PEDIATRICS

Cyril A. L. Abrams, M.D.
 Madeline N. Appel, M.D.
 Julian A. Brower, M.D.
 Phillip R. Ziring, M.D.

ASSISTANT CLINICAL PROFESSORS

Anastasios Anastasiades, M.D.
 Elena Buimovici-Klein, M.D.
 Herbert I. Cohen, M.D.
 Joseph Ferrara, M.D.
 Lucia Rudd, M.D.
 Marianne Schwob, M.D.
 Timo Vesikari, M.D.

INSTRUCTORS

William R. Brown, M.D.
 Marina A. Corpus, M.D.
 Margaret L. Ewing, M.D.
 Carmen Ramos-Bonoan, M.D.
 Nathan E. Saint-Amand, M.D.

At St. Luke's Hospital:

ASSOCIATE PROFESSOR OF CLINICAL PEDIATRICS

Thomas J. Moore, M.D.

ASSISTANT CLINICAL PROFESSORS

Edwardo J. Agasso, M.D.
 Judith E. Frank, M.D.
 Irwin J. Polk, M.D.
 Lucy H. Swift, M.D.
 Phienvit Tantibhedhyangkul, M.D.
 Elizabeth B. Watkins, M.D.
 Doris L. Wethers, M.D.

INSTRUCTORS

Joseph A. Cannaliato, M.D.
 Diane Hoherlin, M.D.
 Fadel M. Hochroth, M.D.
 William A. Kaloss, M.D.
 Catherine Lodyjensky, M.D.
 Edward A. Nichols, M.D.

ASSISTANTS

Dennis J. Allendorf, M.D.
 Ricurda L. Baum, M.D.
 Khin Hnin Lwin, M.D.

Pharmacology

PROFESSORS

Lowell M. Greenbaum, PH.D.
 Brian F. Hoffman, M.D.
 (Hosack Professor and Chairman)
 Frederick G. Hofmann, PH.D.
 Wilbur H. Sawyer, M.D.
 Shih-Chun Wang, M.D.

ADJUNCT PROFESSORS

Howard Sachs, PH.D.
 Jurg A. Schneider, M.D.
 Sidney Spector, PH.D.
 (see Anesthesiology)

Pharmacology (continued)

ASSOCIATE PROFESSORS

John T. Bigger, M.D.
(see Medicine)
Kenneth Eakins, M.D.
(Ophthalmology)
Norman Kahn, D.D.S.
Hsueh-Hwa Wang, M.D.

ADJUNCT ASSOCIATE PROFESSOR

Paul F. Cranefield, M.D.

ASSISTANT PROFESSORS

Edward B. Kirsten, M.D.
Michael R. Rosen, M.D.
Lance L. Simpson, M.D.
(see Psychiatry)
Andrew L. Wit, PH.D.

ADJUNCT ASSISTANT PROFESSORS

Marvin R. Blumenthal, M.D.
Elizabeth E. Le Bourhis, PH.D.
Martin M. Winbury, PH.D.

ASSOCIATES

Peter K. T. Pang, PH.D.
Samuel M. Ross, B.E.E.

RESEARCH ASSOCIATES

John D. Allen, PH.D.
Tsui-Chin Chou, PH.D.
Joel Kupersmith, PH.D.
(Surgery)
Toru Niinaka, D.M.S.
Hiroko Nishimura, PH.D.
Rosemary K. Pang, PH.D.
Ajai Prakash, PH.D.
Eugene P. Schoener, PH.D.
Daniel Weinberg, PH.D.
Robert M. Weiss, M.D.

Physiology

PROFESSORS

Shu Chien, M.B.
William L. Nastuk, PH.D.
David Schachter, M.D.
John V. Taggart, M.D.
(Dalton Professor and
Chairman)

ASSOCIATE PROFESSORS

Martin Blank, PH.D.
John S. Britten, M.D.
Louis I. Cizek, M.D.
Raymond Emmers, M.D.
Arthur Karlin, PH.D.
(Neurology)
Mero Nocenti, PH.D.
(Neurology)

Denis F. Halmagyi, M.D.
(Surgery)
Paul Witkovsky, PH.D.
(Ophthalmology)

SENIOR RESEARCH ASSOCIATE

Shanichi Usami, M.D.

ASSISTANT PROFESSORS

Michel Ferin, M.D.
(Obstetrics and Gynecology)
Jorge Fischbarg, M.D.
(Ophthalmology)

RESEARCH ASSOCIATES

Richard E. Abbott, PH.D.
Jack T. Alexander, B.S.
Szloma Kowarski, M.A.

INSTRUCTOR

Kung-Ming Jan, PH.D.

Psychiatry

PROFESSORS

Arthur C. Carr, PH.D.
(Medical Psychology)
Bruce P. Dohrenwend, PH.D.
(Social Sciences)
Ernest M. Gruenberg, M.D.
(Epidemiology)
Howard F. Hunt, PH.D.
(Medical Psychology)
Jerome H. Jaffe, M.D.
Lawrence C. Kolb, M.D.
(Chairman)
Maurice M. Rapport, PH.D.
(Biochemistry)
Leon Roizin, M.D.
(Neuropathology)
Leo Srole, PH.D.
(Social Science)
Samuel Sutton, PH.D.
(Medical Psychology)
William N. Thetford, PH.D.
(Medical Psychology)

PROFESSORS OF CLINICAL PSYCHIATRY

H. Donald Dunton, M.D.
Ronald R. Fieve, M.D.
Archibald R. Foley, M.D.
(Public Health)
Lothar Gidro-Frank, M.D.
Murray Glusman, M.D.
Otto F. Kernberg
Donald S. Kornfeld, M.D.
Sidney Malitz, M.D.
John D. Rainer, M.D.
(see Human Genetics
and Development)

CLINICAL PROFESSORS

Arnold Cooper, M.D.
Willard Gaylin, M.D.
Aaron Karush, M.D.

John P. Lambert, M.D.
Roger MacKinnon, M.D.
Lionel Ovesey, M.D.
Marvin E. Perkins
Alberta B. Szalita, M.D.
John J. Weber, M.D.

ASSOCIATE PROFESSORS

W. Crawford Clark, PH.D.
(Medical Psychology)
Mavis Kaufman, M.D.
(Neuropathology)
Irving Kupferman, M.D.
(Medical Psychology)
Jacques Rutschmann, D.S.C.
(Medical Psychology)

ASSOCIATE PROFESSORS OF CLINICAL PSYCHIATRY

Marvin Herz, M.D.
Joseph Jaffe, M.D.
Lissy F. Jarvik, M.D.
Robert Michels, M.D.
James H. Ryan, M.D.
Bernard Schoenberg, M.D.
Helen Schucman, PH.D.
(Medical Psychology)
Robert Spitzer, M.D.

ASSOCIATE CLINICAL PROFESSORS

Kenneth Z. Altschuler, M.D.
James P. Cattell, M.D.
Stanley R. Lesser, M.D.
Joseph Lubart, M.D.
John F. O'Connor, M.D.
Rita G. Rudel, M.D.
(Medical Psychology)
Daniel Shapiro, M.D.
Herbert Spiegel, M.D.
Bluma Swerdlhoff, D.S.W.
(Psychiatric Social Work)
Winifred Winikus, M.S.
(Psychiatric Social Work)

ASSISTANT PROFESSORS

George Alexander, PH.D.
(Biochemistry)
Gerald Cohen, PH.D.
(Biochemistry)
Donald Dillon, PH.D.
(Medical Psychology)
Loise Erlenmeyer-Kimling, PH.D.
John Gibbon, PH.D.
(Medical Psychology)
Barry Gurland, M.D.
Muriel Hammer, M.D.
(Social Sciences)
Donald E. Hutchings, PH.D.
(Medical Psychology)
Maureen B. Kanzler, PH.D.
(Medical Psychology)
Dennis D. Kelly, PH.D.
(Medical Psychology)
Lenore M. Kopeloff, PH.D.
Herbert Meltzer, PH.D.
(Biochemistry)

Psychiatry (continued)**ASSISTANT PROFESSORS (continued)**

Lawrence Sharpe, M.D.
 Lance L. Simpson, M.D.
 (Pharmacology)
 David Stern, M.D.
 Cornelis L. Stokman, M.D.
 (Medical Psychology)
 Benjamin Weiss, PH.D.
 (Biochemistry)

ASSISTANT PROFESSORS OF CLINICAL PSYCHIATRY

Levon Z. Boyajian, M.D.
 David L. Dunner, M.D.
 Reginald Taylor, M.D.
 Ralph N. Wharton, M.D.
 George H. Wilkie, M.D.

ASSISTANT CLINICAL PROFESSORS

Andre B. Ballard, M.D.
 Leah Beck, M.D.
 Alexander Beller, M.D.
 Jules R. Bemporad, M.D.
 Milton Berger, M.D.
 Hugh Butts, M.D.
 Robert J. Campbell, M.D.
 Max P. Cohen, M.D.
 Louise Coleman, M.D.
 John A. Cook, M.D.
 DeWitt Crandell, M.D.
 Zira DeFries, M.D.
 Richard G. Druss, M.D.
 Stephen K. Firestein, M.D.
 Olga Frankel, M.D.
 Richard A. Gardner, M.D.
 Myron R. Gershberg, M.D.
 Rodman Gilder, M.D.
 Alexander H. Glassman, M.D.
 Victor Goldin, M.D.
 Jerome D. Goodman, M.D.
 Sol L. Goodman, M.D.
 Don R. Heacock, M.D.
 Herbert Hendin, M.D.
 Winslow R. Hunt, M.D.
 David Jaffe, M.D.
 Stuart L. Keill, M.D.
 Peter Laderman, M.D.
 Frederick Lane, M.D.
 Norman Lazar, M.D.
 Alexander Levay, M.D.
 Florence Liben, M.D.
 (Psychology)
 Robert S. Liebert, M.D.
 Mary C. McKay, M.D.
 Frederick Mendelsohn, M.D.
 Helen C. Meyers, M.D.
 Ruth Moulton, M.D.
 Winfred Overholser, Jr., M.D.
 Robert P. Parkin, M.D.
 James M. Perel, PH.D.
 David Peretz, M.D.
 Alvin H. Polatin, M.D.
 Seymour Post, M.D.

Kathryn F. Prescott, M.D.
 Jesse Schomer, M.D.
 Kendon Smith, M.D.
 John A. Sours, M.D.
 Aaron Stern, M.D.
 Nettie Terestman, M.D.
 Milton Viederman, M.D.
 Josef H. Weissberg, M.D.
 Exie E. Welsch, M.D.

ASSOCIATES

John Atchley, M.D.
 Burton August, M.D.
 Athanasia Balkoura, M.D.
 Stephen Bennett, M.D.
 Paul A. Bradlow, M.D.
 John P. Briggs, M.D.
 Aurelio Buonanno, M.D.
 Paul F. Califano, M.D.
 John Cederquist, M.D.
 Sonia Charif, M.D.
 Leonard Diamond, M.D.
 David V. Forrest, M.D.
 Eugene Forster, M.D.
 Eugene Friedberg, M.D.
 Lee R. Gardner, M.D.
 Louis J. Gilbert, M.D.
 Alvin J. Glick, M.D.
 Ivan Goldberg, M.D.
 Gurston D. Goldin, M.D.
 Fiona Graham, M.B.
 Kenneth Greenspan, M.D.
 Fred I. Hahn, M.D.
 Lloyd A. Hamilton, Jr., M.D.
 Stanley S. Heller, M.D.
 Morton M. Hodas, M.D.
 Clifton M. Howard, M.D.
 Frank Jewett, M.D.
 Daniel Justman, M.D.
 Charles W. Lamb, M.D.
 Gabriel V. Laury, M.D.
 Leon Lefer, M.D.
 Naomi Leiter, M.D.
 Stephen J. Levitan, M.D.
 Stanley Lituchy, M.D.
 Virginia Lozzi, M.D.
 Neil MacLean, M.D.
 Eugene M. Martin, M.D.
 Philip Mertz, M.D.
 Donald I. Meyers, M.D.
 Ira L. Mintz, M.D.
 Paul W. Mosher, M.D.
 Leonard Moss, M.D.
 E. Rea Paidoussi, M.D.
 Samuel W. Perry III
 Ethel Person, M.D.
 Stephen Reibel, M.D.
 Terry C. Rodgers, M.D.
 Elias Savitsky, M.D.
 Robert Shapiro, M.D.
 Charles Siegel, M.D.
 Robert Silbert, M.D.
 Arthur Stein, M.D.

Sanford W. Stein, M.D.
 Jerome Steiner, M.D.
 Michael H. Stone, M.D.
 Ruth Szmaraag, M.D.
 Ann R. Turkel, M.D.
 Nicholas R. J. Willson, M.D.

RESEARCH ASSOCIATES

Alexander R. Askenasy, M.D.
 Ruth Bennett, PH.D.
 June Blum, PH.D.
 (Medical Genetics)
 Richard L. Blumenthal, PH.D.
 Roger M. Christenfeld, M.D.
 Judith Eckman, M.D.
 Jean Endicott, M.D.
 Richard S. Feldman, M.D.
 Anita K. Fischer, PH.D.
 Mark Flapan, PH.D.
 (Public Health)
 Kenneth Frank, PH.D.
 Edward L. Greene, M.D.
 Joseph H. Herson, M.D.
 Herman Kaufman, PH.D.
 (Biochemistry)
 Mitchell L. Kietzman, M.D.
 Alemka Kisic, PH.D.
 (Biochemistry)
 Burton Lerner, M.D.
 (Internatl. Institute for Study of Human Reproduction)
 Julien Mendelewicz, M.D.
 Bonnie B. Meskin, M.D.
 Robert E. Patton, M.D.
 Dina D. Paul, M.D.
 Stephanie Portnoy, M.D.
 Kurt Salzinger, PH.D.
 (Medical Psychology)
 Suzanne Salzinger, M.D.
 Nicholas Samios, M.D.
 Eleanor Singer, PH.D.
 Hadassan Tamir, PH.D.
 (Biochemistry)
 Michael Tobin, M.E.E.
 David Wilder, M.D.
 Philip Zeidenberg, M.D.

INSTRUCTORS

Syed Abdullah, M.B.
 Harry D. Albert, M.D.
 Peter Aldin, M.D.
 Frederic A. Alling, M.D.
 Michael Aronoff, M.D.
 Donald C. Bell, M.D.
 Robinette N. Bell, M.D.
 Estelle P. Bender, M.D.
 Raymond Bernick, M.D.
 Anne E. Bernstein, M.D.
 Abraham A. Bridger, M.D.
 Thomas M. Cassidy, M.D.
 Leon Chattah, M.D.
 Stanley J. Coen, M.D.
 Dennis Dalton, M.D.
 Harry Diener, M.D.
 Harold B. Escover, M.D.

Psychiatry (continued)**INSTRUCTORS (continued)**

Jerry Finkel, M.D.
 Gerald I. Fogel, M.D.
 Bruce Forester, M.D.
 Marjorie H. Frank
 Richard C. Friedman, M.D.
 Iona H. Ginsburg, M.D.
 Robert A. Glick, M.D.
 Maurice Golbey, M.D.
 Max Goldberg, M.D.
 Peter Gorham, M.D.
 Myra S. Hatterer, M.D.
 Gregory Heimarck, M.D.
 Joel S. Hoffman, M.D.
 Carlos Ifarraguerri, M.D.
 David Iverson, M.D.
 Lila J. Kalinich, M.D.
 James G. Katis, M.D.
 Shepard J. Kantor, M.D.
 Neil B. Kavey
 Augustus F. Kinzel, M.D.
 Lawrence I. Levitt, M.D.
 Brian P. Lipton, M.D.
 Ronald B. Lonesome, M.D.
 George W. Luhrmann, M.D.
 Josephine D. Martin, M.D.
 Michael R. Milano, M.D.
 John D. O'Brien, M.D.
 Vladimir R. Piskacek, M.D.
 Phyllis B. Robbins, M.D.
 Barbara R. Rosenfeld, M.D.
 Arnold M. Rothstein, M.D.
 M. Bruce Sarlin, M.D.
 Arthur H. Schore, M.D.
 Eleanor Schuker, M.D.
 Morton D. Seigel, M.D.
 Lawrence Shaderowsky, M.D.
 Edward M. Shelley, M.D.
 Michael Shostak, M.D.
 Frieda H. Spady, M.D.
 Charles F. Spalding, M.D.
 Frank Stallone, M.D.
 Walter Tuchman, M.D.
 Alan J. Tuckman, M.D.

ASSISTANTS

Charles J. Barbanel, M.D.
 Charles Carluccio, M.D.
 Diana C. Cook, M.D.
 Raymond Devlin, M.D.
 Ellen M. Dolganos, M.D.
 Aristide H. Esser, M.D.
 Eda G. Goldstein, M.D.
 Norma Hakusa, M.D.
 Ann G. Keill, M.D.
 Susan Matorin, M.D.
 James W. Montgomery, M.D.
 Bobba J. Moody, M.D.
 William J. Nemon, M.D.
 Helene Schoenfeld, M.D.
 Beth Silverman, M.D.
 Rishon Stember, M.D.

Grace C. K. Sum, M.D.
 Barbara C. Von Bulow, M.D.

LECTURERS

Courtenay L. Bennett, M.D.
 (Public Health)
 Milton M. Berger, M.D.
 Victor Bernal, M.D.
 Henry Brill, M.D.
 Henry A. Davidson, M.D.
 Barbara S. Dohrenwend, M.D.
 Samuel L. Feder, M.D.
 Richard J. Glavin, M.D.
 Hanna E. Kapit, PH.D.
 Alvin Mesnikoff, M.D.
 George Mora, M.D.
 Francis J. O'Neill, M.D.
 (Public Health)
 Leon Salzman, M.D.
 Jay Schulman, M.D.
 Harold F. Searles, M.D.
 Natalie Shainess, M.D.
 John H. Shapiro, M.D.
 Patricia A. Tueting, M.D.
 Sheldon Zimberg, M.D.

SPECIAL LECTURERS

Benjamin Balser, M.D.
 Viola W. Bernard, M.D.
 George Goldman, M.D.
 George A. Jervis, M.D.
 Henriette R. Klein, M.D.
 Joseph Zubin, M.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSOR
 Harvey Gurian, M.D.

ASSOCIATES

John E. Denny, M.D.
 Peter M. Johngren, M.D.

INSTRUCTOR

R. Suzanne Gibson, M.D.

At Creedmoor State Hospital:

ASSISTANT CLINICAL PROFESSOR
 John R. Whittier, M.D.

At Harlem Hospital:

PROFESSOR OF CLINICAL PSYCHIATRY
 Elizabeth B. Davis, M.D.

ASSOCIATE PROFESSOR OF CLINICAL PSYCHIATRY

Virginia N. Wilking, M.D.

ASSOCIATE CLINICAL PROFESSOR

Jack Sheps, M.D.

ASSISTANT CLINICAL PROFESSORS

Margaret M. Lawrence, M.D.
 Austin Moore, M.D.
 Raymond Raskin, M.D.

ASSOCIATES

Bruce L. Ballard, M.D.

Gladys Egri, M.D.
 Barbara Gibbs, M.D.
 Gideon Nachumi, M.D.
 John W. Rosenberger, M.D.
 Peter-Heinrich G. Schween, M.D.
 Susana L. Van Alstine, M.D.

INSTRUCTORS

Esther R. Ashley, M.D.
 Edmund Chaitman, M.D.
 Pauline Edwards, M.D.
 Gladys C. Halvorsen, M.D.
 Milton Lee, M.D.
 J. Trevor Lindo, M.D.
 Raymond W. Ransom, M.D.

At Henry Ittleson Center for Child Psychiatry:

CLINICAL PROFESSOR

William Goldfarb, M.D.

At Manhattan State Hospital:

ASSOCIATE CLINICAL PROFESSOR
 A. Anthony Acre, M.D.

ASSISTANT CLINICAL PROFESSOR

John A. Talbott, M.D.

INSTRUCTORS

Luis N. Alberti, M.D.
 Wallace R. Forstell, M.D.
 Peter F. Gaston, M.D.
 Donald F. Mesec, M.D.
 Charles R. Tucek, M.D.

ASSISTANT

Stuart Marcus, M.D.

At Rockland State Hospital:

CLINICAL PROFESSOR

Nathan Kline, M.D.

ASSISTANT

George Simpson, M.D.

RESEARCH ASSISTANT

Per B. Vestergaard, M.D.

At Roosevelt Hospital:

CLINICAL PROFESSORS

Bernard L. Pacella, M.D.
 Harley C. Shands, M.D.

ASSISTANT CLINICAL PROFESSORS

Arthur N. Avella, M.D.
 Nobel A. Endicott, M.D.
 Bernard H. Hall, M.D.
 Steven E. Katz, M.D.
 Harry R. Potter, M.D.
 Lilli C. Shalsa, M.D.
 Arthur Weider, PH.D.
 (Medical Psychology)

ASSOCIATES (*continued*)

William H. Brownlee, M.D.
 Aaron H. Esman, M.D.
 Blanche Glass, M.D.
 (Medical Psychology)
 Justin L. Greene, M.D.
 Richard G. Kopff, Jr., M.D.
 Jeffrey Kramer, M.D.
 Alma Levinson, M.D.
 (Medical Psychology)
 Martin I. Lubin, M.D.
 Mitchell S. Rosenthal, M.D.
 George Satran, M.D.
 Robert D. Scharf, M.D.
 William D. Wheat, M.D.

INSTRUCTORS

Norman V. Balinson, M.D.
 Helen A. Derosis, M.D.
 Martin D. Doft
 G. Alden Ellison, M.D.
 Edward W. Kloth, M.D.
 Woon Soon Lee, M.D.
 Donald J. Mayerson, M.D.
 James M. McGowan
 Arthur M. Perlman, M.D.
 Barry L. Singer, M.D.

ASSISTANTS

Gail B. Allen, M.D.
 Arline C. Caldwell, M.D.
 John David, M.D.
 Allan D. Gordon, M.D.
 Peter A. Howland, M.D.
 Michael Kennin, M.D.
 Robert L. Meineker, M.D.
 Maximo R. Monterrey, M.D.
 Andrzej Nikonorow, M.D.
 Nestor J. Totero, M.D.
 David S. Weinberger, M.D.

At St. Luke's Hospital:

CLINICAL PROFESSOR

John Cotton, M.D.

ASSISTANT PROFESSOR OF CLINICAL PSYCHOLOGY

Adam Munz, M.D.

ASSISTANT CLINICAL PROFESSORS

Eugene B. Feigelson, M.D.
 Clarice J. Kestenbaum, M.D.
 David M. MacDonald, M.D.
 John A. Milici, M.D.
 George O. Papanek, M.D.

ASSOCIATES

Alex Caemmerer, Jr., M.D.
 Samuel C. Klagsbrun, M.D.
 Melvin M. Udel, M.D.

INSTRUCTORS

Hector A. Bird, M.D.
 James L. Cadden, M.D.
 Irene Chiarandini, M.D.
 Ralph Colp, Jr., M.D.

Richard C. Conroy, M.D.
 Victor D'Arc, M.D.
 Nathaniel Donson, M.D.
 James H. Egan, M.D.
 Sirgay Sanger, M.D.
 Bernardo S. Scheimberg, M.D.
 Ira Silverstein, M.D.
 William G. Sommer, M.D.
 Henry I. Spitz, M.D.
 Lawrence J. Van Der May

ASSISTANTS

Kenneth M. Berc, M.D.
 Edward E. Gilmour, M.D.
 Willard S. Kahn, M.D.
 Eli C. Messinger, M.D.

Public Health

PROFESSORS

Lowell E. Bellin, M.D.
 (Health Administration)
 John H. Bryant, M.D.
 (DeLamar Professor and
 Chairman)
 Jack Elinson, PH.D.
 (Sociomedical Sciences)
 John W. Fertig, PH.D.
 (Biostatistics)
 Ernest M. Gruenberg, M.D.
 (Epidemiology—from
 Psychiatry)
 Michael Katz, M.D.
 (Tropical Medicine)
 Thomas S. Langner, PH.D.
 (Epidemiology)
 Mervyn W. Susser, M.D.
 (Epidemiology)
 Frank W. van Dyke, M.S.
 (Administrative Medicine)
 Roger W. Williams, PH.D.
 (Medical Entomology)
 Samuel M. Wishik, M.D.
 (Public Health Practice)

PROFESSOR OF CLINICAL PSYCHIATRY

Archie R. Foley, M.D.

ADJUNCT PROFESSORS

Arne C. Barkhuus, M.D.
 (Public Health Practice)
 Myron Brin, M.D.
 (Public Health Nutrition)
 Robert H. Hamlin, M.D.
 (Health Administration)
 Benjamin Pasamanick, M.D.
 (Epidemiology)
 Nora Piore, M.A.
 (Health Economics)
 Howard B. Shookhoff, M.D.
 (Tropical Medicine)
 Joseph V. Terenzio, M.S.
 (Health Administration)
 Ernest L. Wynder, M.D.
 (Public Health Practice)

ASSOCIATE PROFESSORS

Agnes P. Berger, PH.D.
 (Biostatistics)
 Stanley Budner, PH.D.
 (Sociomedical Sciences)
 Bernard D. Challenor, M.D.
 (Health Administration)
 John L. Colombotos, PH.D.
 (Sociomedical Sciences)
 Elinor F. Downs, M.D.
 (Public Health Practice)
 Frances R. Gearing, M.D.
 (Epidemiology)
 Allen S. Ginsberg, PH.D.
 (Health Administration)
 Sami A. Hashim, M.D.
 (Public Health Nutrition)
 A. Walter Hoover, M.D.
 (Occupational Medicine)
 Eric Josephson, PH.D.
 (Sociomedical Sciences)
 Harriet B. Presser, PH.D.
 (Sociomedical Sciences)
 Granville H. Sewell, PH.D.
 (Environmental Health)
 Zena A. Stein, M.D.
 (Epidemiology)
 Elmer L. Struening, PH.D.
 (Epidemiology)
 William C. Thomas, PH.D.
 (Public Health Practice)
 Andre A. O. Varma, M.D.
 (Biostatistics)

SENIOR RESEARCH ASSOCIATES

Lillian M. Belmont, PH.D.
 (Epidemiology)
 Ann F. Brunswick, M.A.
 (Sociomedical Sciences)
 Neal W. Chilton, D.D.S.
 (Biostatistics)
 Paul W. Haberman
 (Sociomedical Sciences)
 Moni Nag
 (International Institute Study
 of Human Reproduction)
 Gerhart H. Saenger, PH.D.
 (Epidemiology)

ADJUNCT ASSOCIATE PROFESSORS

Albert J. Beckmann, M.D.
 (Public Health Practice)
 Emanuel Bund, J.Sc.D.
 (Public Health Law)
 Ashton C. Cuckler, PH.D.
 (Parasitology)
 Carl L. Erhardt, Sc.D.
 (Biostatistics)
 Morton A. Fischer, D.D.S.
 (Health Administration)
 Joseph L. Fleiss, PH.D.
 (Biostatistics)
 Frank E. Iaquina, M.D.
 (Health Administration)
 Hollis S. Ingraham, M.D.
 (Public Health Practice)

Public Health (continued)ADJUNCT ASSOCIATE PROFESSORS
(continued)

Denise B. Kandel, PH.D.
(Sociomedical Sciences)
James R. Kimmey, M.D.
(Public Health Practice)
Eugene D. Rosenfeld, M.D.
(Administrative Medicine)
Irving S. Shapiro, PH.D.
(Public Health Education)

ASSISTANT PROFESSORS

Margery M. Braren, PH.D.
(Sociomedical Sciences)
Noreen M. Clark, M.A.
(Health Administration)
Catherine deAngelis, M.D.
(Health Administration—from Pediatrics)
Dickinson D. Despommier, M.D.
(Parasitology)
Ora S. Fagan, M.S.W.
(Epidemiology)
Brant E. Fries, PH.D.
(Health Administration)
Robert H. Friis, M.D.
(Epidemiology)
Harold Fruchtbaum, PH.D.
(History and Philosophy of Public Health)
Anna K. Gelman
(Epidemiology)
Joanne C. Gersten, PH.D.
(Epidemiology)
Seth B. Goldsmith, SC.D.
(Health Administration)
Holger H. Hansen, M.D.
(Epidemiology)
Donald W. Helbig, M.D.
(Health Administration)
Nathan Lefkowitz, PH.D.
Regina Loewenstein, M.D.
(Administrative Medicine)
Francis A. Marolla
Beatrice Mintz, M.D.
(Administrative Medicine)
Mata K. Nikias, PH.D.
(Sociomedical Sciences)
Lloyd F. Novick, M.D.
(Health Administration)
Dhun B. Patel, PH.D.
(Environmental Health Sciences)
Frederick B. Putney, PH.D.
(Health Administration)
David Rush, M.D.
(Epidemiology)
Paul L. Selbst, M.S.
(Health Administration)
Clarence Teng
(Health Administration)

ADJUNCT ASSISTANT PROFESSORS

Raymond S. Alexander, M.S.
(Health Administration)

Suzanne Bennett-Clark, PH.D.
(Public Health Nutrition)
Roland P. Brown, PH.D.
(Tropical Medicine)
Patricia R. Cohen, PH.D.
(Epidemiology)
Rodolphe L. Coigney, M.D.
(Public Health Practice)
DeWitt L. Crandell, M.D.
(Epidemiology—see Psychiatry)
Samuel Davis, M.S.
(Administrative Medicine)
William R. Donovan, M.D.
(Public Health Practice)
John D. Frame, M.D.
(Tropical Medicine)
Jack J. Goldman, M.D.
(Public Health Practice)
Iwan D. Guichert, M.D.
(Tropical Medicine)
Vincent F. Guinée, M.D.
(Epidemiology)
John C. Jeffrey, M.B.
(Tropical Medicine)
Nicetas H. Kuo, M.D.
(Public Health Practice)
William L. Nute, Jr., M.D.
Percival B. Phillips, ED.D.
(Public Health Practice)
Dorothy Roels, M.D.
(Health Administration)
Esther A. Schisa, M.D.
(Public Health Practice)
Wolf Szmunn, M.D.
(Epidemiology)
Robert E. Wallace, M.D.
(Public Health Practice)
Janet Wittes, PH.D.
(Epidemiology)

ASSOCIATES

Michael Gochfeld, M.D.
(Occupational Medicine)
Constance Rogers
(Health Administration)

RESEARCH ASSOCIATES

Paul N. Borzky, B.A.
(Occupational Medicine)
Patricia J. Collette, M.A.
(Sociomedical Sciences)
Mary G. Curnen, M.D.
(Epidemiology)
Robert W. Jones, M.A.
(Sociomedical Sciences)
Corinne Kirschner, B.A.
(Sociomedical Sciences)
Lida Orzeck, PH.D.
(Epidemiology)
Anne S. Zanes, PH.D.
(Sociomedical Sciences)

INSTRUCTORS

Natalie Becker, M.C.P.
(Health Administration)

Martin G. Blechman, M.D.
(Tropical Medicine)
Robert S. Bloom, PH.D.
(Public Health Education)
Marjorie A. Costa, M.D.
(Public Health Practice)
Robert E. Emann, B.B.A.
(Administrative Medicine)
Marjorie H. Frank
(Administrative Medicine)
Henry N. Fremont, M.D.
(Parasitology)
Susan Goodfriend
(Health Administration)
Alden Hammerling
(Health Administration)
Dulcy B. Miller, B.A.
(Health Administration)
Molly H. Park, M.A.
(Biostatistics)
Emil J. Pascarelli, M.A.
(Administrative Medicine)
Marcia L. Pinkett
(Health Administration)
Livia R. Turgeon, M.S.
(Biostatistics)
Alex Tytun, B.S.
(Biostatistics)
Chung C. Wang, M.D.
(Tropical Medicine)

ASSISTANTS

Carol A. Bodian, M.S.
(Biostatistics)
Cherry L. Lowman, B.S.
(Public Health Nutrition)
Richard H. Perry, B.A.
(Administrative Medicine)
Bruce A. Price, B.A.
(Administrative Medicine)
Athilia E. Siegman, M.S.
(Health Administration)

SENIOR STAFF ASSOCIATES

Jeanne A. Eisenberg, M.A.
(Epidemiology)
Inge F. Goldstein, M.D.
(Epidemiology)
Sheila A. Gorman
(Health Administration)

STAFF ASSOCIATES

Walter W. Curtis, PH.D.
(Health Administration)
Hillard Davis, M.D.
(Epidemiology)
Elizabeth D. McCarthy, M.A.
(Epidemiology)
Floyd W. McCormick, M.D.
(Epidemiology)
Bess I. Miller, M.P.H.
(Public Health Nutrition)
Carol R. Tarcia, M.A.
(Sociomedical Sciences)
Caron Todd, M.A.
(Sociomedical Sciences)

STAFF ASSOCIATES (*continued*)

Geraldine A. Widner, PH.D.
(Health Administration)

SENIOR LECTURER

Gloria L. A. Dammann, M.P.H.

LECTURERS

Kenneth Adamec, M.D.
George H. Adams, M.S.
Robin F. Badgley, PH.D.
George Baehr, M.D.
Gerald Bauman, PH.D.
A. J. Binkert, B.A.
Howard J. Brown, M.D.
Martin Cherkasky, M.D.
George J. Christakis, M.D.
Joseph A. Cimino, M.D.
Jean B. Cropper, M.P.H.
Frank J. DeScipio, M.S.
Benjamin G. Dinin, M.D.
Gary M. Eidsvold, M.D.
Nelson F. Evans, M.D.
Pearl R. Fisher, R.N.
Stephen L. Forstenzer, M.S.
Sylvan S. Furman, M.D.
Natalie Goldart
Morrell Goldberg, B.A.
Harvey Gollance, M.D.
Irving Gottsegen, M.S.
Edward V. Grant
Beulah Gutenstein, M.P.H.
Jack C. Haldeman, M.D.
Virginia R. Hannon, SC.D.
David Harris, M.D.
William H. Hermann, M.S.
E. Jeffrey High, M.D.
Florence Kaveler, M.D.
Daniel Klepak, M.D.
Schuyler G. Kohl, M.D.
John T. Kolody, M.S.
Jacob Levine
Milton Maloney, M.D.
Robert Markowitz, M.D.
Paul S. May, D.SC.
Mary C. McLaughlin, M.D.
Max Milner, M.D.
Richard Nauen, M.D.
Daniel O'Hare, M.D.
Jean Pakter, M.D.
Marvin E. Perkins, M.D.
Joseph P. Peters, M.S.
Olive E. Pitkin, M.D.
Peter Rogatz, M.D.
Stephen N. Rosenberg, M.D.
Maurice V. Russell, ED.D.
Morris Schaeffer, M.D.
Bernard M. Schiffman, M.S.
Harvey Schoenfeld, M.B.A.
Martin E. Segal
Sam Shapiro, B.S.
Ralph F. Sikes, M.D.
Joseph E. Snyder, M.D.
David W. Stewart, B.A.
Richard A. Stalnacke, M.S.
Vernon C. Stutzman, M.S.

Sister Margaret M. Sweeney, M.S.
Eleanor B. Townsend, M.D.
Martin S. Ulan, M.S.
Edward H. Van Ness, PH.B.
Louis Weiner, E.E.
Benjamin Werne, J.S.D.
Samuel Wolfe, M.P.H.

SPECIAL LECTURERS

Leonard J. Goldwater, M.D.
W. Henry Sebrell, M.D.

At Harlem Hospital:

ADJUNCT ASSOCIATE PROFESSOR
Elliott C. Roberts, M.A.
(Administrative Medicine)

ASSISTANT PROFESSORS
Thomas W. Jones
(Health Administration)
Noel F. Parris, M.A.
(Administrative Medicine)
Arthur C. Williams, D.D.S.
(Dental Public Health Practice)

ASSOCIATES

Earland Cyrus, M.D.
(Health Administration)
Alva Jenkins, M.D.
(Administrative Medicine)
Constance C. Rogers, M.S.
(Health Administration)

RESEARCH ASSOCIATE

Morton R. Siegel, M.A.
(Sociomedical Sciences)

INSTRUCTORS

Edna K. Ford, B.S.
(Administrative Medicine)
Theresa E. Russell, M.A.
(Health Administration)

ASSISTANTS

Richard H. Perry, M.S.
(Administrative Medicine)
Bruce A. Price, B.S.
(Administrative Medicine)

Radiology

PROFESSORS

David H. Baker, M.D.
Walter E. Berdon, M.D.
Chu Huai Chang, M.D.
Kent Ellis, M.D.
Ruth J. Guttmann, M.D.
Eric J. Hall, M.D.
(Physics)
Sadek Hilal, M.D.
Philip M. Johnson, M.D.
Albrecht M. Kellerer, PH.D.
(Radiation Biophysics)
Harald H. Rossi, PH.D.
(Physics)

William B. Seaman, M.D.
(Chairman)
Ernest H. Wood, M.D.

PROFESSORS OF CLINICAL RADIOLOGY

Guy D. Potter, M.D.
Ralph G. Schlaeger, M.D.

ADJUNCT PROFESSORS

Victor P. Bond, PH.D.
Thomas P. Vogl, PH.D.
(Radiation Physics)

ASSOCIATE PROFESSOR

Frieda Feldman, M.D.

ASSOCIATE PROFESSORS OF CLINICAL RADIOLOGY

Thane Asch, M.D.
Donald L. King, M.D.
Walter G. Lutz, M.D.
Patricia Tretter, M.D.

ASSOCIATE CLINICAL PROFESSORS

Meyer Alpert, M.D.
Arnold L. Bachman, M.D.

ADJUNCT ASSISTANT PROFESSOR

Bruce J. Biavati, PH.D.
(Physics)

ASSISTANT PROFESSORS

Carmine Borek, M.D.
James A. Reilly, M.D.

ASSISTANT PROFESSORS OF CLINICAL RADIOLOGY

John H. Austin, M.D.
David A. Follett, M.D.
Shelby Galloway, M.D.
Ira Horowitz, M.D.
Patricia S. Kaim, M.D.
Peter Livingston, M.D.
Kevin L. Macken, M.D.
Harry S. Morgan, M.D.
Bruce E. Wiley, M.D.

ASSISTANT CLINICAL PROFESSORS

William L. Campbell, M.D.
William J. Casarella, M.D.
Louis A. Rottenberg, M.D.

ASSOCIATE

Charles M. Herbert, Jr., M.D.

RESEARCH ASSOCIATES

Robert D. Colvett, M.S.
Robert F. Dvorak, M.S.
Leon J. Goodman, PH.D.
(Physics)
Alan G. Underbrink, M.D.
(Radiological Physics)

INSTRUCTORS

Michael D. Cooper, M.D.
Peter D. Esser, M.D.
Herbert Gerstein, M.D.

Radiology (continued)

INSTRUCTORS (continued)

William M. Green, M.D.
William Griffin, M.D.
Peter M. Joseph, M.D.
Paul Sane, M.D.
Robert Silbey, M.D.
Ruey R. Wu, PH.D.

At Mary Imogene Bassett Hospital:

ASSISTANT CLINICAL PROFESSOR
Otto D. Sahler, M.D.

INSTRUCTORS

Robert D. Henretig, M.D.
Peter T. Koch-Weser, M.D.

At Harlem Hospital:

ASSOCIATE CLINICAL PROFESSOR
Theodore R. Stent, M.D.

ASSISTANT PROFESSORS OF CLINICAL RADIOLOGY

Christopher A. Johnson, M.D.
Laurencia B. Regalado, M.D.
Headley Scott, M.D.

ASSISTANT CLINICAL PROFESSOR
Jeanne Armstrong, M.D.

At Roosevelt Hospital:

ASSOCIATE CLINICAL PROFESSOR
Albert A. Dunn, M.D.

ASSISTANT CLINICAL PROFESSORS

David S. Marsden, M.D.
John de L. Morris, M.D.
George Stassa, M.D.
Harold Stitt, M.D.

INSTRUCTORS

Paula W. Brill, M.D.
Carmel N. Donovan, M.D.

At St. Luke's Hospital:

PROFESSOR OF CLINICAL RADIOLOGY
Nathaniel Finby, M.D.

ASSOCIATE PROFESSOR OF CLINICAL RADIOLOGY

Richard D. Kittridge, M.D.

ASSOCIATE CLINICAL PROFESSORS

Kuo-York Chynn, M.D.
Virginia Kanick, M.D.

ASSISTANT PROFESSOR OF CLINICAL RADIOLOGY

John T. Hsu, M.D.

ASSISTANT CLINICAL PROFESSOR

Leonard M. Liegner, M.D.

INSTRUCTORS

Ina A. Altman, M.D.
Jeanne W. Baer, M.D.
Robert A. Phillips, M.D.
Mary Ann Radkowski, M.D.
William I. Shaw, M.D.

Rehabilitation Medicine

PROFESSORS

John A. Downey, M.D.
Charles A. Huckaba, PH.D.

CLINICAL PROFESSOR

Morton Hoberman, M.D.

ASSOCIATE PROFESSOR OF CLINICAL PSYCHIATRY

Bernard Shoenberg, M.D.
(Acting Chairman)

ASSISTANT PROFESSOR

Stanley J. Myers, M.D.

ASSISTANT CLINICAL PROFESSOR

Antonio Cocchiarella, M.D.

ASSOCIATES

Marjorie Kellogg, M.S.
Naomi L. Turner, M.S.

RESEARCH ASSOCIATE

Wallace W-K. Luke, B.A.

INSTRUCTORS

Ludmilla S. Finkelstein, M.D.
Damyanti G. Moorjani, M.D.

ASSISTANT

Vivienne Katz, M.A.

At Harlem Hospital:

PROFESSOR OF CLINICAL
REHABILITATION MEDICINE
Albert D. Anderson, M.D.

ASSOCIATE PROFESSOR OF CLINICAL REHABILITATION MEDICINE

Herbert L. Thornhill, M.D.

ASSISTANT PROFESSORS OF CLINICAL REHABILITATION MEDICINE

Lucille C. Gunning, M.D.
(Pediatrics)
Claire Schiller, M.B.

ASSISTANT CLINICAL PROFESSORS

Roy H. Brown, M.D.
Yasoma B. Challenor, M.D.

ASSOCIATE

Horace W. Cosla, M.D.

INSTRUCTORS

Wanda Brodzka, M.A.
Cecelia A. Macauley, M.A.

At New York State Rehabilitation Hospital:

ASSOCIATE CLINICAL PROFESSOR
Luke S. W. Chu, M.D.

ASSISTANT CLINICAL PROFESSOR
Rodolfo L. Reyes, M.D.

ASSOCIATE

Cayetano C. Co, M.D.

INSTRUCTORS

Alfred Hess, M.D.
Sally Wiseley, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSOR
John J. Untereker, M.D.

At St. Luke's Hospital:

ASSOCIATE CLINICAL PROFESSOR
Shyh-Jong Yue, M.D.

ASSISTANT CLINICAL PROFESSOR
Lucille Tsu Pai, M.D.

INSTRUCTOR

Ravi Raj Malpe, M.D.

ASSISTANT

Dong Wook Cho, M.D.

Occupational Therapy

ASSOCIATE PROFESSOR

Marie-Louise Franciscus, M.A.

ASSISTANT PROFESSOR

Adelaide A. Deutsch, M.A.

ASSISTANT CLINICAL PROFESSOR

Karen F. B. Diasio, M.A.

ASSOCIATES

Gail S. Fidler, B.A.
Nedra P. Gillette, B.S.
Eleanor Shelly, B.S.

INSTRUCTORS

Barbara E. Neuhaus, B.S.
Alice R. Trei, B.S.

At Harlem Hospital:

INSTRUCTOR
Margaret F. Brown, M.A.

Physical Therapy

ASSOCIATE PROFESSORS

Mary E. Callahan, M.A.
Ruth Dickinson, M.A.
Althea M. Jones, B.S.

Rehabilitation Medicine*(continued)***ASSOCIATES**

Theodore Corbitt, M.A.
Bernadette Hecox, B.S.

INSTRUCTOR

Judith R. Hogan

At Blythedale Children's Hospital:

INSTRUCTOR

Robert Stone, M.D.

At Harlem Hospital:

INSTRUCTOR

Joseph A. Molloy, M.A.

Surgery**PROFESSORS**

Jose M. Ferrer, M.D.
Charles L. Fox, M.D.
(from Microbiology)
David V. Habif, M.D.
(Milstein Professor)
Frederic P. Herter, M.D.
(Auchincloss Professor)
Robert B. Hiatt, M.D.
Thomas C. King, M.D.
John M. Kinney, M.D.
Nathan Lane, M.D.
(Surgical Pathology)
Raffaele Lattes, M.D.
(Surgical Pathology)
Keith Reemtsma, M.D.
(Mott Professor and Johnson and
Johnson Professor and
Chairman)
Thomas V. Santulli, M.D.

PROFESSORS OF CLINICAL SURGERY

Harold G. Barker, M.D.
George F. Crikelair, M.D.
James R. Malm, M.D.
Ferdinand F. McAllister, M.D.
Milton R. Porter, M.D.
Arthur B. Voorhees, M.D.

ASSOCIATE PROFESSORS

Frank E. Gump, M.D.
Denis F. J. Halmagyi, M.D.
(Physiology)
Gordon I. Kaye, PH.D.
(Surgical Pathology)
John B. Price, Jr., M.D.
Marianne Wolff, M.D.
(Surgical Pathology)

ASSOCIATE PROFESSORS OF CLINICAL SURGERY

Frederick O. Bowman, Jr., M.D.
Joseph A. Buda, M.D.
Bard Cosman, M.D.
Carl R. Feind, M.D.

Alfred M. Markowitz, M.D.
John F. Prudden, M.D.
Grant Sanger, M.D.
Francis C. Symonds, Jr., M.D.
Bashir A. Zikria, M.D.

ASSOCIATE CLINICAL PROFESSORS

Hugh Auchincloss, Jr., M.D.
Charles W. Findlay, M.D.
Edmund N. Goodman, M.D.
Alfred Jaretzki, III, M.D.
David M. C. Ju, M.D.
Herbert C. Maier, M.D.
Edward B. Self, M.D.
Philip D. Wiedel, M.D.

SENIOR RESEARCH ASSOCIATE

John R. Broell
(Chemical Engineering and
Applied Chemistry)

ASSISTANT PROFESSORS

Richard N. Edie, M.D.
Kenneth Forde, M.D.
Irving Goodman, PH.D.
(Biochemistry)
Paul Lo Gerfo, M.D.
Nicole Suciu-Foca, M.D.
(Pathology)
Richard Weil, III, M.D.

ASSISTANT PROFESSORS OF CLINICAL SURGERY

Robert G. Bertsch, M.D.
Shivaji B. Bhonslay, M.D.
Sven Kister, M.D.
John N. Schullinger, M.D.

ASSISTANT CLINICAL PROFESSORS

Harold P. Freeman, M.D.
Paul H. Gerst, M.D.

RESEARCH ASSOCIATES

Sidney J. Bennett, M.D.
Bang Mo Kim
(Chemical Engineering)
Joel Kupersmith, PH.D.
(from Pharmacology)
Magda Levy, SC.NAC.
Calvin Long, PH.D.
Duncan L. McColester, M.D.
Shanta M. Modak, M.D.
Ben T. Sandler, M.D.

INSTRUCTORS

Stamatis E. Arkoulakis, M.D.
Alfred Azzoni, M.D.
Harold M. Bruck, M.D.
Sherman M. Bull, M.D.
Donald L. Heimlich, M.D.
Martin H. Max, M.D.
Robert J. Mulcare, M.D.
Charles A. Slanetz, M.D.
Phillip W. Thieman, M.D.
James S. Todd, M.D.

SPECIAL LECTURER

William A. Gardner, M.D.

At Mary Imogene Bassett Hospital:

PROFESSOR OF CLINICAL SURGERY

David A. Blumenstock, M.D.

ASSOCIATE CLINICAL PROFESSORS

Rodman D. Carter, M.D.
(Urology)
John E. Olsen, M.D.

ASSISTANT CLINICAL PROFESSORS

Thomas P. Ashford, M.D.
Edward J. Carey, Jr., M.D.
Thomas A. Farrell, M.D.
(Ophthalmology)

At Harlem Hospital:

ASSOCIATE PROFESSORS OF CLINICAL SURGERY

Eugene T. Quash, M.D.
Frederick R. Randall, M.D.

ASSOCIATE CLINICAL PROFESSORS

John E. Hutchinson, M.D.
Robert F. Morton, M.D.
John W. Parker, Jr., M.D.

ASSISTANT CLINICAL PROFESSORS

Salvatore G. Cinque, M.D.
Arthur L. Garnes, M.D.
Walter W. Miner, M.D.

ASSOCIATES

Lowyd W. R. Ballantyne, Jr., M.D.
Matthew D. Branche, M.D.
E. Foster Conklin, M.D.
Seldin J. Dickinson, M.D.
Malcolm Moley, M.D.
Ronald N. Ollstein, M.D.
Vincent Porter, M.D.
Lawrence E. Taylor, M.D.
Irving J. Thorne, M.D.
Pierre G. Von Bockstaele, M.D.

INSTRUCTORS

Vincent W. Ansanelli, M.D.
Richard W. Brenner, M.D.
Boris C. Chandler, M.D.
Eustace E. S. Corbin, M.D.
Egel Francois, M.D.
Edoardo Giuliani, M.D.
George K. Henry, M.D.
Autar S. Josen, M.D.
Haroutune Mekhjian, M.D.
Barnett M. Miller, M.D.
Mohamed H. Parsa, M.D.
Max Yergan, Jr., M.D.

At Roosevelt Hospital:

PROFESSOR OF CLINICAL SURGERY

Walter Wichern, M.D.

Surgery (continued)

ASSOCIATE CLINICAL PROFESSORS

William H. Cassebaum, M.D.
 Richard G. Eaton, M.D.
 Joseph Ford, M.D.
 Charles C. Harrold, Jr., M.D.
 Adrian Lambert, M.D.
 J. William Littler, M.D.
 Cedric J. Priebe, M.D.
 James B. Rodgers, M.D.
 Thomas S. Royster, M.D.

ASSISTANT CLINICAL PROFESSORS

John T. Brennan, Jr., M.D.
 David M. Carberry, M.D.
 Paul D. Harris, M.D.
 James A. MacDonald, M.D.
 James H. Terry, Jr., M.D.
 T. Scudder Winslow, M.D.
 Chin Bor Yeoh, M.D.

INSTRUCTORS

H. Clay Alexander, M.D.
 Thomas H. Dailey, M.D.
 Clarence A. Dunn, Jr., M.D.
 William V. Healey, Jr., M.D.

At St. Luke's Hospital:

PROFESSOR

Lawrence E. Stevens, M.D.

PROFESSORS OF CLINICAL SURGERY

Hugh F. Fitzpatrick, M.D.
 Richard B. Stark, M.D.

CLINICAL PROFESSOR

John P. West, M.D.

ASSOCIATE CLINICAL PROFESSORS

W. Graham Knox, M.D.
 Colin W. McCord, M.D.
 Edward C. Stanley-Brown, M.D.

ASSISTANT CLINICAL PROFESSORS

Peter A. Bossart, M.D.
 Robert T. Edmunds, M.D.
 Robert W. Fraser, M.D.
 Conrad G. Lattes, M.D.
 Robert E. McCabe, M.D.
 Robert E. Miller, M.D.
 Howard R. Nay, M.D.
 Carl S. Oakman, M.D.

INSTRUCTORS

Charles R. Blair, M.D.
 Clayton R. DeHaan, M.D.
 Alfred A. Moscarella, M.D.
 Hiroshi Washio, M.D.
 John J. White, M.D.
 Samuel D. Winner, M.D.

ASSISTANTS

Leif O. Holgersen, M.D.
 Lawrence F. Simon, M.D.

Urology

PROFESSOR

John K. Lattimer, M.D.
 (Chairman)

PROFESSOR OF CLINICAL UROLOGY

Ralph J. Veenema, M.D.

ASSOCIATE PROFESSOR

Myron Tannenbaum, M.D.
 (from Pathology)

ASSOCIATE PROFESSORS
OF CLINICAL UROLOGY

Laurelio C. Uson, M.D.
 Hans H. Zinsser, M.D.

ASSOCIATE CLINICAL PROFESSORS

Stanley B. Braham, M.D.
 Myron S. Roberts, M.D.
 Perrin B. Snyder, M.D.

ASSISTANT PROFESSORS

Harry Seneca, M.D.
 Philip Tomashefsky, PH.D.
 (from Pathology)
 Michael H. Wechsler, M.D.

ASSISTANT PROFESSORS
OF CLINICAL UROLOGY

Peter J. Puchner, M.D.
 Nicholas A. Romas, M.D.
 Arthur M. Smith, M.D.

ASSISTANT CLINICAL PROFESSORS

Peter N. DeSanctis, M.D.
 J. Timothy Donovan, M.D.
 Louis J. Dougherty, M.D.
 John P. Grant, M.D.
 Michael W. Justice, M.D.
 Frank W. Longo, M.D.
 Sandor H. Wax, M.D.

ASSOCIATES

Charles E. Umhey, Jr., M.D.
 Ralph C. Yeaw, M.D.

RESEARCH ASSOCIATE

Stanford Pulrang, M.D.

INSTRUCTORS

Frederick S. Dick, M.D.
 Clement A. Furey, Jr., M.D.
 Erol O. Gorsel, M.D.
 Robert Granato, M.D.
 Philip B. Jensen, M.D.
 Robert R. White, III, M.D.
 Arthur T. Willetts, M.D.

ASSISTANTS

Luis M. Abreu, M.D.
 Stanley Bloom, M.D.
 John C. Byrne, M.D.
 Richard Fadil, M.D.
 Stanley J. Landau, M.D.

SPECIAL LECTURERS

Bruno Fingerhut, M.D.
 Meyer M. Melicow, M.D.

At Mary Imogene Bassett Hospital:

ASSOCIATE CLINICAL PROFESSOR

Rodman D. Carter, M.D.
 (from Surgery)

At Harlem Hospital:

ASSISTANT CLINICAL PROFESSOR

Harold A. Garnes, M.D.

INSTRUCTOR

Urbana K. Guarin, M.D.

At Roosevelt Hospital:

ASSISTANT CLINICAL PROFESSORS

William J. Nelson, M.D.
 Robert D. Wickham, M.D.

INSTRUCTOR

James W. Vastola, M.D.

At St. Luke's Hospital:

ASSISTANT PROFESSOR OF
CLINICAL UROLOGY

Manuel Fernandes, M.D.

ASSISTANT CLINICAL PROFESSOR

Joseph N. Ward, M.D.

INSTRUCTORS

Alfred F. Fretz, M.D.
 Waleed G. Maloof, M.D.
 Constantine Photos, M.D.
 Joseph D. Putignano, M.D.
 Rudolph D. Talarico, M.D.
 Pellegrino J. Tozzo, M.D.

ASSISTANT

Arambi P. Subramaniam

*International Institute for the
Study of Human Reproduction*

DIRECTOR

Raymond L. Vande Wiele, M.D.

PROFESSORS

Georgiana Jagiello, M.D.
 (Obstetrics and Gynecology and
 Human Genetics and
 Development)
 Seymour Lieberman, PH.D.
 (Biochemistry)
 Robert S. Neuwirth, M.D.
 (Obstetrics and Gynecology)
 Ralph M. Richart, M.D.
 (Obstetrics and Gynecology
 and Pathology)

***International Institute for the
Study of Human Reproduction***
(continued)

PROFESSORS (continued)

Raymond L. Vande Wiele, M.D.
(Obstetrics and Gynecology)

ASSOCIATE PROFESSORS

Robert Lewis, PH.D.
(Geography)
Harriet B. Presser, PH.D.
(Public Health)

SENIOR RESEARCH ASSOCIATE

Moni Nag, PH.D.

ASSOCIATE CLINICAL PROFESSOR

John O'Connor, M.D.
(Psychiatry)

ASSISTANT PROFESSORS

Peter Carmel, M.D.
(Neurological Surgery)
Michel Ferin, M.D.
(Physiology)
Linbania Jacobson, ED.D.
(Nursing)
Raphael Jewelewicz, M.D.
(Obstetrics and Gynecology)
C. Dominique Toran-Allerand
(Neurology)
Earl Zimmerman, M.D.
(Neurology)

ASSISTANT CLINICAL PROFESSOR

Anne Pierson, M.D.
(Obstetrics and Gynecology)

RESEARCH ASSOCIATES

Milagros Benedicto, M.D.
Kwan-Hwa Chen, M.A.
Martin E. Gorosh, M.D.
Donald Helbig, M.D.
Burton Lerner, M.D.
Jose Oliva, M.S.
Bernard G. Pasquariella, M.A.
Susan Scrimshaw, M.A.
Julia Shimmel, M.A.
Lenore O. Stern, M.A.
Prem Talwar, PH.D.
David Wolfers, PH.D.

Institute of Cancer Research

DIRECTOR

Sol Spiegelman, PH.D.

PROFESSORS

Philip Feigelson, PH.D.
(Biochemistry)
Elliott F. Osserman, M.D.
(Medicine)
Sol Spiegelman, PH.D.
(Human Genetics and
Development)
I. Bernard Weinstein, M.D.
(Medicine)

ASSOCIATE PROFESSORS

Dezider Grunberger, PH.D.
(Biochemistry)

ASSISTANT PROFESSORS

Mehdi Farhangi, M.D.
(Medicine)
Daniel Kacian, PH.D.
(Human Genetics and
Development)
Donald R. Mills, PH.D.
(Human Genetics and
Development)

RESEARCH ASSOCIATES

William Cuatico, M.D.
Barbara Jones, B.A.
Tamar Landau, PH.D.
Tohru Nishihara, PH.D.
Peter S. Pulkrabek, PH.D.
Israel I. Schechter, M.D.
Gunther A. Schutz, M.D.
Leos G. Veprek, M.D.
Michael V. Viola, M.D.
Nobuo Yamaguchi, M.D.

Institute of Human Nutrition

DIRECTOR

Myron Winick, M.D.

PROFESSORS

John W. Fertig, PH.D.
(Biostatistics)
DeWitt S. Goodman, M.D.
(Medicine)

Michael Katz, M.D.
(Tropical Medicine)
Hollis R. Lynch, PH.D.
(History)
Mary B. McCann, M.D.
(Nutrition, Teachers College)
Mervin Susser, M.D.
(Epidemiology)
Theodore B. Van Itallie, M.D.
(Medicine)
Myron Winick, M.D.
(Pediatrics)
Robert Winters, M.D.
(Pediatrics)

ADJUNCT PROFESSOR

Myron Brin, PH.D.
(Public Health Nutrition)

ASSOCIATE PROFESSORS

Jo Anne Brasel, M.D.
(Pediatrics)
Elinor F. Downs, M.D.
(Public Health Practice)
Sami A. Hashim, M.D.
(Public Health Nutrition)
Ruth C. Harris, M.D.
(Pediatrics)
Richard S. Rivlin, M.D.
(Medicine)

ASSISTANT PROFESSORS

Robert S. Bernstein, M.D.
(Medicine)
F. Xavier Pi-Sunyer, M.D.
(Medicine)
David Rush, M.D.
(Epidemiology)

ASSISTANT CLINICAL PROFESSOR

Thomas W. Patrick, Jr., M.D.
(Pediatrics)

ADJUNCT ASSISTANT PROFESSORS

Suzanne Bennett-Clark, PH.D.
(Public Health Nutrition)
Pedro Rosso, M.D.
(Pediatrics)

RESEARCH ASSOCIATE

Gloria V. Moore

SPECIAL LECTURER

W. Henry Sebrell, Jr., M.D.
(Public Health Nutrition)

Academic Staff

School of Dental and Oral Surgery
Columbia University in the City of New York

Academic Staff

School of Dental and Oral Surgery Columbia University in the City of New York

Emeritus Officers

Carl R. Oman.....*Restorative Dentistry*
Gilbert P. Smith.....*Restorative Dentistry*
(and Dean Emeritus)

Frances A. Stoll.....*Dental Hygiene*

Clinic

ASSOCIATE PROFESSOR
Hyman D. Koch, D.D.S.

Community Health

ASSOCIATE PROFESSOR
Harold L. Applewhite, D.D.S., M.P.H.

ADJUNCT PROFESSOR
David A. Soricelli, D.D.S., M.P.H.

ADJUNCT ASSOCIATE PROFESSORS
Neal Alan Demby, D.M.D.
Carlton A. Sparks, D.D.S., M.P.H.
Barry M. Weinberg, D.D.S.

ADJUNCT ASSISTANT PROFESSOR
Daniel H. Bloom, D.D.S.
Hilton O. Hosannah, D.D.S., M.P.H.
Yale J. Pava, D.D.S., M.P.H.
Houston R. Reagin, D.D.S.
William Steibel, D.D.S.

LECTURERS
Frank R. Hopf, D.D.S., M.P.H.
Herbert Williams, M.S.

SPECIAL LECTURER
Sydney C. Rappaport, D.D.S.

Dental Auxiliary Utilization

ASSOCIATE PROFESSOR
David Kaplan, D.D.S.

ADJUNCT PROFESSOR
Matthew D. Levin, D.D.S.

ASSISTANT CLINICAL PROFESSOR
Joseph E. Kafer, D.M.D.

ADJUNCT ASSISTANT PROFESSORS
S. Gerald Cardinale, D.D.S.
Martin Handlers, D.D.S.
Robert L. Jacobson, D.D.S.

INSTRUCTORS
Edgar Gattegno, D.D.S.
James J. Johnson, D.D.S.
Eugene M. Levine, D.M.D.
Irwin Mindell, D.D.S.

Dental Hygiene

ASSOCIATE PROFESSOR
Patricia A. McLean, M.A., R.D.H.

ASSISTANT PROFESSORS
Marlene Klyvert, B.S., R.D.H.
Dona E. W. McKinney, B.S., R.D.H.

ADJUNCT ASSISTANT PROFESSOR
Ronald B. Odrich, D.D.S.

INSTRUCTORS
Michele Darby, B.S., R.D.H.
Charlotte Hangorsky, B.S., R.D.H.

TEACHING ASSISTANTS
Carolyn F. Gray, B.S., R.D.H.
Martha L. Liggett, B.S.

Endodontics

CLINICAL PROFESSORS
Joseph M. Leavitt, D.D.S.
Irving J. Naidorf, D.D.S.

ADJUNCT PROFESSOR
Fred Rothenberg, D.D.S.

ASSOCIATE CLINICAL PROFESSORS
S. Abel Moreinis, D.D.S.

ADJUNCT ASSOCIATE PROFESSOR
Marvin Firdman, D.D.S.

ADJUNCT ASSISTANT PROFESSORS
Robert L. Ambinder, D.D.S.
Philip J. Bauer, D.M.D.
Gerald H. Besen, D.D.S.
Murray A. Cantor, D.D.S.
Fredric E. Goodman, D.D.S.
Edward Greenfield, D.D.S.
Harmon R. Katz, D.D.S.
Michael Pleshette, D.D.S.
Norbert Ripp, D.D.S.
Charles S. Solomon, D.D.S.
Howard B. Vogel, D.D.S.

INSTRUCTORS
Gerald M. Drew, D.D.S.

TEACHING ASSISTANT
Nona I. Brecland, B.S.

Education and Behavioral Science

ASSOCIATE PROFESSOR
Samuel F. Dworkin, D.D.S., PH.D.

RESEARCH ASSOCIATES
Deborah F. Diserens, B.A.
Judith Essig, B.A.

Operative Dentistry

PROFESSOR
Edward A. Cain, Jr., D.D.S.

ASSOCIATE CLINICAL PROFESSORS
Stanislaw H. Brzustowicz, D.D.S.
Steven S. Scrivani, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS
Kenneth C. Deesen, D.D.S.
William H. Silverstein, D.D.S.

ASSISTANT CLINICAL PROFESSORS
Roy Boelstler, D.D.S.
Frank W. Pandolfo, D.D.S.

ADJUNCT ASSISTANT PROFESSORS
Pandelis Camesas, D.D.S.
Herbert P. Fritz, D.D.S.
Frank L. Mellana, D.D.S.
Joseph A. Pianpiano, D.D.S.
George Rudensky, D.D.S.

INSTRUCTORS
Alvin T. Boyd
Richard A. Greenberg, D.D.S.
Walter A. Gutstein, D.D.S.
John F. Kosinski, D.D.S.
Roger P. Santise, D.D.S.

LECTURERS
James W. Benfield, D.D.S.
George F. Lindig, D.D.S.
George V. Lyons, D.D.S.

Oral Biology

- PROFESSOR
Melvin L. Moss, D.D.S., PH.D.
- ASSOCIATE PROFESSOR
David J. Smith, D.D.S.
- ASSISTANT PROFESSOR
Letty Moss-Salentijn, D.D.S.
(Anatomy)
- ASSISTANT CLINICAL PROFESSOR
Henry P. Levy, D.D.S.
- SPECIAL LECTURER
Edmund Applebaum, D.D.S.
(Anatomy)
- ASSOCIATE
Philip Person, D.D.S., PH.D.

Oral Surgery

- CLINICAL PROFESSORS
Louis Mandel, D.D.S.
George A. Minervini, D.D.S.
- ADJUNCT PROFESSORS
Harold D. Baurmash, D.D.S.
Louis J. Loscalzo, D.D.S.
George L. O'Grady, D.D.S.
- ADJUNCT ASSOCIATE PROFESSORS
Kourken A. Daglian, D.D.S.
Bertram Klatskin, D.D.S.
Boaz M. Shattan, D.D.S.
Morton J. Stern, D.D.S.
- ADJUNCT ASSISTANT PROFESSORS
Anthony L. DiMango, D.D.S.
John Esposito, Jr., D.D.S.
Robert L. Haas, D.D.S.
Ian Y. Hu, D.D.S.
Harold Marantz, D.D.S.
Morton Netupsky, D.M.D.
Daniel D. Schube, D.D.S.
- INSTRUCTORS
Quentin M. Murphy, D.D.S.
Herbert Rabinowitz, D.D.S.

- At the Roosevelt Hospital:
PROFESSOR OF CLINICAL DENTISTRY
Andrew M. Linz, D.D.S., M.S.C.
- ADJUNCT PROFESSOR
Peter B. Terenzio, L.L.B., M.H.A.
- ADJUNCT ASSOCIATE PROFESSOR
Edward B. Armstrong, D.D.S.
- ADJUNCT ASSISTANT PROFESSORS
Gerald E. Lederman, D.D.S.
David Schwartz, D.D.S.
- At St. Luke's Hospital:
PROFESSOR OF CLINICAL DENTISTRY
Edward Stroh, D.D.S.
- ADJUNCT ASSOCIATE PROFESSOR
Abbe J. Selman, D.D.S.

- ADJUNCT ASSISTANT PROFESSORS
E. Joseph Marged, D.D.S.
Richard H. Sand, D.D.S.
- INSTRUCTORS
Jay P. Goldsmith, D.M.D.
David M. Kritchman, D.D.S.
Kenneth L. Levy, D.M.D.

Orofacial Development

- PROFESSOR
Sidney L. Horowitz, D.D.S.
- ASSOCIATE CLINICAL PROFESSOR
Henry R. Junemann, D.D.S.
- ASSISTANT CLINICAL PROFESSOR
Alice J. Chabora, PH.D.
- ADJUNCT ASSISTANT PROFESSORS
Godofredo V. Benedicto, D.D.S.
Gary L. Lighter, D.M.D.
- INSTRUCTORS
Erlinda A. Benedicto, D.M.D.
Arnold L. Fink, D.D.S.
- RESEARCH ASSOCIATE
Heli A. Vinkka, D.D.S.

Orthodontics

- PROFESSOR
Nicholas A. Di Salvo, D.D.S., PH.D.
- ADJUNCT PROFESSOR
Clifford LeR. Whitman, D.D.S.
- ASSOCIATE PROFESSOR
Henry I. Nahoum, D.D.S.
- ADJUNCT ASSOCIATE PROFESSORS
Monroe M. Gliedman, D.D.S.
Richard Gliedman, D.D.S.
Jacob I. Kaplan, D.D.S.
Eugene F. Murphy, D.D.S.
Armand M. Oppenheimer, D.D.S.
Julius Tarshis, D.D.S.
- ASSISTANT PROFESSOR
James B. Horn, D.D.S.
- ASSISTANT CLINICAL PROFESSOR
Lawrence W. Bergmann, D.D.S.
Herbert Ostreicher, D.D.S.
- ADJUNCT ASSISTANT PROFESSORS
Howard S. Anstendig, D.M.D.
Abraham M. Blechman, D.D.S.
Robert J. Huettnier, D.D.S.
Robert Isaacson, D.D.S.
Gustave Lasoff, D.D.S.
Vincent E. Lynch, D.D.S.
Edward C. McNulty, D.M.D.
Malcolm E. Meistrell, Jr., D.D.S.
- INSTRUCTOR
Viktoria I. Kohler, D.D.S.

- LECTURERS
Robert M. Cole, D.D.S.
Harry A. Galton, D.D.S.
Stanley L. Gibbs, D.D.S.
Howard J. Ruderman, D.D.S.
- RESEARCH ASSOCIATES
Solomon L. Katz, D.D.S.
Irwin Steuer, D.D.S.
- ASSISTANTS
Richard F. Ceen, D.D.S.
Michael F. Rudolph, D.D.S.

Pedodontics

- PROFESSOR
Solomon N. Rosenstein, D.D.S.
- ADJUNCT PROFESSOR
Arnold Rosenberg, D.D.S.
- ADJUNCT ASSOCIATE PROFESSORS
Albert Green, D.D.S.
Marvin B. King, D.D.S.
Seymour Koster, D.D.S.
Philip Kutner, D.D.S.
Julian Schroff, D.D.S.
- ASSISTANT CLINICAL PROFESSOR
Barbara B. Rocco, D.D.S.
- ADJUNCT ASSISTANT PROFESSORS
George Kiriakopoulos, D.D.S.
Alfred J. Mezza, D.D.S.
Daniel W. Silfen, D.D.S.
William A. Verlin, D.D.S.
David H. Wolmer, D.D.S.
- LECTURERS
Jerry J. Adelson, D.D.S.
Robert L. Fisher, D.D.S.

Periodontics

- PROFESSOR
Robert Gottsegen, D.D.S.
- CLINICAL PROFESSOR
Murray Schwartz, D.D.S.
- ADJUNCT PROFESSORS
Frank E. Beube, L.D.S., D.D.S.
Leonard S. Hirschfeld, D.D.S.
Melvin L. Morris, D.D.S.
- ASSOCIATE CLINICAL PROFESSOR
Wesley Halpert, D.D.S.
- ADJUNCT ASSOCIATE PROFESSORS
Bernard S. Moskow, D.D.S., M.S.C.D.
Albert Salkind, D.D.S.
Bernard H. Wasserman, D.D.S.
- ASSISTANT CLINICAL PROFESSORS
Robert L. Blair, D.D.S.
Raymond Z. Darakjian, D.D.S.
Burton Langer, D.M.D., M.S.C.D.
- ADJUNCT ASSISTANT PROFESSORS
Vincent J. Abbatiello, D.M.D.
Michael Baron, D.D.S.
Robert D. Blank, D.M.D.

ADJUNCT ASSISTANT PROFESSORS (continued)

Herman Cantor, D.D.S.
Alvin D. Cederbaum, D.M.D.
P. Charles Gabriele, D.D.S.
Arnold M. Geiger, D.D.S.
Jack Goetz, D.D.S.
Stephen F. Goodman, D.D.S.
Raymond F. Johnson, Jr., D.D.S.
Irving A. Karel, D.D.S.
Milton Klempert, D.D.S.
Walter I. Lipow, D.D.S.
Alan Lubarr, D.M.D.
David M. Monahan, D.D.S.
Morton C. Rennert, D.D.S.
Michael B. Savin, D.M.D.
Marvin Solomon, D.D.S.
Marvin Spodek, D.D.S.
Stephen D. Stein, D.D.S.

INSTRUCTORS

George L. Glick, D.D.S.
Stephen Silston, D.D.S.

TEACHING ASSISTANT

Patricia A. Morgan, B.S.

Preventive Dentistry

PROFESSOR

Irwin D. Mandel, D.D.S.

ASSOCIATE PROFESSORS

Samuel F. Dworkin, D.D.S., PH.D.
Stephen Wotman, D.D.S.
(Special Assistant to the Dean)

ADJUNCT ASSOCIATE PROFESSOR

Herbert I. Oshrain, D.D.S.

ASSISTANT PROFESSORS

Daniel H. Fine, D.M.D.
Spyros Vratsanos, PH.D.
Albert N. Zengo, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Robert S. Goldman, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Lillian H. Bachman, D.D.S.
Robert S. Breakstone, D.D.S.
Harold P. Cobin, D.D.S.
Neal L. Kaplan, D.D.S.
Stephen V. Mender, D.M.D.
Kenneth L. Siegel, D.D.S.
Paul J. Tannenbaum, D.D.S.

INSTRUCTORS

David C. Abelson, D.D.S.
Howard Gordon, D.D.S.
Stephen R. Katz, D.D.S.
Richard Lehrer, D.D.S.

LECTURERS

Marvin Mansky, D.D.S.
Arthur B. Weiss, D.D.S.

SENIOR RESEARCH ASSOCIATE

Neal W. Chilton, D.D.S., M.P.H.

RESEARCH ASSOCIATE

Ephraim Weinstein, D.D.S.

TEACHING ASSISTANTS

Valerie C. Been, B.S.
Kristen H. Talbott, B.S.

Prosthodontics

PROFESSOR

John J. Lucca, D.D.S.

ADJUNCT PROFESSORS

Sebastian A. Bruno, D.M.D.
Victor S. Caronia, D.D.S.
Robert E. Herlands, D.D.S.
George W. Hindels, M.D., D.D.S.
William J. Miller, D.D.S.

ASSOCIATE PROFESSORS

Herbert D. Ayers, D.D.S.
Ennio L. Uccellani, D.D.S.

ASSOCIATE CLINICAL PROFESSORS

Jacob Abelson, D.D.S.
Alvin J. Grayson, D.D.S.
Maxwell Widrow, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Joseph A. De Julia, D.D.S.
Gustav T. Durrer, D.D.S.
Max P. Fishberg, D.D.S.
Joel Friedman, D.D.S.
Gerald M. Galvin, D.D.S.
Joel Goldin, D.M.D.
John M. Scarola, D.D.S.

ASSISTANT CLINICAL PROFESSOR

Wayne A. Drysdale, D.D.S.
Alfred Holzman, D.D.S.
Dennis N. Morea, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Harold H. Blank, D.D.S.
Barney M. Croll, D.D.S.
S. Robert Davidoff, D.M.D.
Stanley P. Freeman, D.D.S.
Kenneth Jackier, D.D.S.
Arnold S. Jutkowitz, D.M.D.
Robert D. Miner, D.D.S.
Ralph K. Neuhaus, D.D.S.
William Raebeck, Jr., D.D.S.
Louis I. Rubins, D.D.S.
Peter H. Strife, II, D.D.S.

INSTRUCTORS

James P. McCosker, D.D.S.
Nicholas A. Vero, Sr.
Nicholas A. Vero, Jr., D.D.S.

LECTURER

Morris Eckhaus, D.D.S.

ASSOCIATE

John Waldes, PH.D.

Psychiatric Institute Dental Service

ASSOCIATE PROFESSOR

Austin H. Kutscher, D.D.S.

ASSOCIATE CLINICAL PROFESSOR Arthur Shain, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Joseph C. DeLisi, D.D.S.
Ellen N. Hosiosky, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

William C. Baral, D.D.S.
Martin Bassiur, D.D.S.
Daniel J. Cherico, PH.D.
Gary D. Gross, D.D.S.
Bernard Gurian, D.D.S.
Herman S. Harris, D.D.S.
Jay Weiss, D.M.D.

Stomatology

PROFESSORS

Joseph A. Cuttita, D.D.S.
Edward V. Zegarelli, D.D.S.
(Acting Dean)

ADJUNCT PROFESSORS

Jack Budowsky, D.D.S.
Joseph J. Marbach, D.D.S.

ASSOCIATE CLINICAL PROFESSOR

Michael Z. Marder, D.D.S.

ADJUNCT ASSOCIATE PROFESSORS

Morton S. Brod, D.D.S.
Robert E. Crowley, D.D.S.
Frances R. Karlan, D.D.S.
Mortimer Karmiol, D.D.S.
Eugene P. LaSota, D.D.S.
John K. Lind, D.D.S.
Joseph Luban, D.D.S.
Robert F. Walsh, D.D.S.
David Zeisler, D.D.S.

ASSISTANT PROFESSOR

David J. Zegarelli, D.D.S.

ASSISTANT CLINICAL PROFESSOR

John V. Donovan, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Martin I. Ames, D.D.S.
Jerome Bartwink, D.M.D.
John F. Capriccio, D.D.S.
Martin J. Fields, D.M.D.
Steven I. Gold, D.D.S.
Robert N. Schiff, D.D.S.
Leonard Zaslow, D.D.S.
Edward Zerden, D.D.S.

INSTRUCTORS

James J. Cancro, D.D.S.
Harold Darwin, D.D.S.
James A. Lipton, D.D.S.
John C. Peterson, D.D.S.
John R. Varoscak, D.D.S.

RESEARCH ASSOCIATE

Herbert F. Silvers, D.D.S.

Appendix

EXHIBIT A

THE PRESBYTERIAN HOSP

Bal

DECEMBE

ASSETS

UNRESTRICTED GENERAL AND PLANT FUNDS

	1973	1972
CURRENT:		
Cash	\$ 1,424,721	\$ 3,831,098
Investments (quoted market values—1973, \$76,554; 1972, \$1,030,539)	74,861	1,029,417
Accounts receivable (less allowance for uncollectible accounts— 1973, \$1,294,861; 1972, \$1,160,868)	16,507,572	14,857,359
Inventories	2,377,247	1,929,294
Accrued interest and dividends receivable	878,076	893,211
Prepaid expenses	317,080	157,481
Total current assets	21,579,557	22,697,860
Plant, property and equipment (less accumulated depreciation—1973, \$39,547,303; 1972, \$36,531,292)	78,637,410	76,082,973
TOTAL UNRESTRICTED GENERAL AND PLANT FUNDS	<u>\$100,216,967</u>	<u>\$98,780,833</u>

SPECIFIC PURPOSE FUNDS

Cash	\$ 449,587	\$ 296,830
Investments (quoted market values—1973, \$8,177,958; 1972, \$8,786,211)	8,018,092	7,389,381
Due from general fund	3,821,593	4,005,167
TOTAL SPECIFIC PURPOSE FUNDS	<u>\$ 12,289,272</u>	<u>\$11,691,378</u>

PLANT REPLACEMENT AND EXPANSION FUNDS

Investments (quoted market values—1973, \$34,544,320; 1972, \$38,465,819)	\$ 34,022,347	\$31,797,389
TOTAL PLANT REPLACEMENT AND EXPANSION FUNDS ..	<u>\$ 34,022,347</u>	<u>\$31,797,389</u>

ENDOWMENT FUNDS AND UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT

Cash	\$ 814,230	\$ 273,038
Investments (quoted market values—1973, \$82,997,011; 1972, \$100,268,227)	66,043,508	68,080,307
Due from restricted building funds	5,200,000	6,000,000
TOTAL ENDOWMENT FUNDS AND UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT	<u>\$ 72,057,738</u>	<u>\$74,353,345</u>

See Notes to Financial Statements.

THE CITY OF NEW YORK

EXHIBIT A

et

AND 1972

LIABILITIES AND FUND BALANCES
UNRESTRICTED GENERAL AND PLANT FUNDS

	<i>1973</i>	<i>1972</i>
CURRENT:		
Accounts payable	\$ 4,713,236	\$ 5,169,828
Accrued payroll and other expenses	2,707,508	2,357,119
Current portion of long-term debt	581,813	192,160
Due to specific purpose funds	3,821,593	4,005,167
Total current liabilities	<u>11,824,150</u>	<u>11,724,274</u>
Long-term debt—mortgages payable	<u>679,842</u>	<u>1,318,232</u>
Fund balances (Exhibit C):		
Invested in plant, property and equipment	78,637,410	76,082,973
General fund	<u>9,075,565</u>	<u>9,655,354</u>
Total fund balances	<u>87,712,975</u>	<u>85,738,327</u>
TOTAL UNRESTRICTED GENERAL AND PLANT FUNDS...	<u><u>\$100,216,967</u></u>	<u><u>\$98,780,833</u></u>
SPECIFIC PURPOSE FUNDS		
Restricted fund balances (Exhibits D and G)	\$ 12,289,272	\$11,691,378
TOTAL SPECIFIC PURPOSE FUNDS	<u><u>\$ 12,289,272</u></u>	<u><u>\$11,691,378</u></u>
PLANT REPLACEMENT AND EXPANSION FUNDS		
REPLACEMENT FUND:		
Restricted fund balance (Exhibit D)	\$ 16,982,934	\$11,830,895
Unrestricted fund balance (Exhibit C)	<u>15,566,843</u>	<u>17,376,891</u>
Total replacement fund	<u>32,549,777</u>	<u>29,207,786</u>
BUILDING FUNDS:		
Due to unrestricted funds functioning as endowment	5,200,000	6,000,000
Restricted fund balances (deficit) (Exhibit D)	<u>(3,727,430)</u>	<u>(3,410,397)</u>
Total building funds	<u>1,472,570</u>	<u>2,589,603</u>
TOTAL PLANT REPLACEMENT AND EXPANSION FUNDS...	<u><u>\$ 34,022,347</u></u>	<u><u>\$31,797,389</u></u>
ENDOWMENT FUNDS AND UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT		
Endowment fund balances (Exhibits D and G)	\$ 60,064,733	\$59,821,879
Unrestricted funds functioning as endowment (Exhibits C and G)	<u>11,993,005</u>	<u>14,531,466</u>
TOTAL ENDOWMENT FUNDS AND UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT	<u><u>\$ 72,057,738</u></u>	<u><u>\$74,353,345</u></u>

See Notes to Financial Statements.

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF OPERATING REVENUES AND EXPENSES

For the Years Ended December 31, 1973 and 1972

OPERATING REVENUES:	1973	1972
Care of patients	\$94,270,272	\$87,392,773
Allowances and uncollectible accounts	14,769,998	12,288,555
Net care of patients	79,500,274	75,104,218
Other services	5,382,442	5,589,250
Transfer from specific purpose funds for research, educational and other purposes	2,424,492	2,355,918
TOTAL OPERATING REVENUES (Exhibit C)	<u>87,307,208</u>	<u>83,049,386</u>
OPERATING EXPENSES:		
Administrative and fiscal services:		
Administration	673,511	636,234
Assistant Secretary-Treasurer	1,382,700	1,178,843
Comptroller and data processing	4,001,930	3,635,808
Public interest	343,344	335,236
Non-professional services:		
Buildings and grounds	10,321,681	9,592,591
Food service	6,116,071	5,652,406
Personnel and protective	1,540,573	1,372,872
Other non-professional services	2,217,876	2,056,393
Professional services:		
Nursing	25,886,667	23,566,846
Professional staff, doctors' offices and research	11,633,829	11,090,936
Special services	16,185,301	15,123,709
Vanderbilt Clinic and other	8,044,889	7,374,865
Provision for depreciation	4,584,459	3,813,073
TOTAL OPERATING EXPENSES (Exhibit C)	<u>92,932,831</u>	<u>85,429,812</u>
LOSS FROM OPERATIONS (to Exhibit C)	<u>\$ 5,625,623</u>	<u>\$ 2,380,426</u>

See Notes to Financial Statements.

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF REVENUES AND EXPENSES
AND CHANGES IN UNRESTRICTED FUND BALANCES

For the Years Ended December 31, 1973 and 1972

	General Fund Operations	Other	Funds Functioning As Endowment	Plant Replacement and Expansion Funds	Invested in Plant, Property and Equipment	Total 1973	Total 1972
OPERATING REVENUES (Exhibit B):							
Net care of patients	\$79,500,274					\$ 79,500,274	\$ 75,104,218
Other services	5,382,442					5,382,442	5,589,250
Transfers from specific purpose funds for research, educational and other purposes	2,424,492					2,424,492	2,355,918
Total operating revenues	87,307,208					87,307,208	83,049,386
OPERATING EXPENSES (Exhibit B):							
Salaries and related fringe benefits ..	64,279,760					64,279,760	59,500,425
Supplies and other expenses	24,068,612					24,068,612	22,116,314
Provision for depreciation	4,584,459					4,584,459	3,813,073
Total operating expenses	92,932,831					92,932,831	85,429,812
Loss FROM OPERATIONS (Exhibit B) ..	(5,625,623)					(5,625,623)	(2,380,426)
NON-OPERATING REVENUES:							
Legacies and contributions	\$ 788,961	\$ 263				789,224	776,790
Investment income	2,463,162	508,382		\$ 752,062		3,723,606	3,593,908
Net gain on sales of investments		16,485		7,525		24,010	440,075
Other non-operating revenues							7,500
REVENUES OVER (UNDER) EXPENSES.	(5,625,623)	3,252,123	525,130	759,587		(1,088,783)	2,437,847
FUND BALANCE, JANUARY 1	9,655,354		14,531,466	17,376,891	\$76,082,973	117,646,684	114,043,396
EXPENDITURES FOR PLANT, PROPERTY AND EQUIPMENT	(1,214,671)			(2,569,635)	3,784,306		
TRANSFERS FROM (TO) RESTRICTED FUNDS FOR:							
Additions to plant, property and equipment					3,354,590	3,354,590	4,989,934
Funding of depreciation					(4,584,459)	(4,584,459)	(3,813,073)
Other purposes					(55,209)	(55,209)	(11,420)
INTRA-FUND TRANSFERS:							
Current operating purposes	8,344,964	(3,252,123)	(508,382)		(4,584,459)		
Other	2,500,000		(2,500,000)				
FUND BALANCE, DECEMBER 31	\$ 9,075,565		\$11,993,005	\$15,566,843	\$78,637,410	\$115,272,823	\$117,646,684

See Notes to Financial Statements.

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES

For the Years Ended December 31, 1973 and 1972

SPECIFIC PURPOSE FUNDS

(For Research, Educational and Other Purposes)

	<i>1973</i>	<i>1972</i>
Balance, January 1	<u>\$11,691,378</u>	<u>\$10,417,738</u>
Add:		
Legacies, contributions and grants	1,911,709	2,420,551
Investment income	1,246,055	1,361,786
Net gain on sales of investments	11,528	112,749
Transfer from (to) other funds — net	19,968	(8,756)
Miscellaneous — net	12,875	183,243
	<u>3,202,135</u>	<u>4,069,573</u>
Total	<u>14,893,513</u>	<u>14,487,311</u>
Deduct:		
Transfers to unrestricted funds for:		
Operating revenues	2,424,492	2,355,918
Additions to plant, property and equipment	179,749	440,015
	<u>2,604,241</u>	<u>2,795,933</u>
Balance, December 31	<u><u>\$12,289,272</u></u>	<u><u>\$11,691,378</u></u>

PLANT REPLACEMENT AND EXPANSION FUNDS

REPLACEMENT FUND:

Balance, January 1	<u>\$11,830,895</u>	<u>\$ 7,468,970</u>
Add:		
Funding of depreciation	4,584,459	3,813,073
Investment income	560,484	390,272
Net gain on sales of investments	7,904	158,580
	<u>5,152,847</u>	<u>4,361,925</u>
Total	<u>16,983,742</u>	<u>11,830,895</u>
Deduct — miscellaneous	808	
Balance, December 31	<u><u>\$16,982,934</u></u>	<u><u>\$11,830,895</u></u>

See Notes to Financial Statements.

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES

For the Years Ended December 31, 1973 and 1972

PLANT REPLACEMENT AND EXPANSION FUNDS

	<u>1973</u>	<u>1972</u>
BUILDING FUNDS:		
Balance, January 1	\$(3,410,397)	\$(1,683,792)
Add:		
Legacies, contributions and grants	486,519	2,349,108
Investment income	306,236	308,659
Net gain on sales of investments		53,906
Received from Columbia-Presbyterian Medical Center Fund, Inc.	2,042,603	83,202
Transfer from unrestricted funds	55,209	11,420
Transfer from other funds — net	59,282	16,805
	<u>2,949,849</u>	<u>2,823,100</u>
Total	(460,548)	1,139,308
Deduct:		
Transfer to unrestricted funds for additions to plant, property and equipment	3,174,841	4,549,919
Miscellaneous	92,041	(214)
	<u>3,266,882</u>	<u>4,549,705</u>
Balance, December 31	<u>\$(3,727,430)</u>	<u>\$(3,410,397)</u>

ENDOWMENT FUNDS

Balance, January 1	<u>\$59,821,879</u>	<u>\$58,591,213</u>
Add:		
Legacies, contributions and grants	141,454	197,104
Net gain on sales of investments	107,458	1,036,162
Miscellaneous	73,192	5,449
	<u>322,104</u>	<u>1,238,715</u>
Total	60,143,983	59,829,928
Deduct — Transfer to other funds — net	79,250	8,049
Balance, December 31	<u>\$60,064,733</u>	<u>\$59,821,879</u>

See Notes to Financial Statements.

EXHIBIT E

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

**STATEMENT OF CHANGES IN FINANCIAL POSITION OF
UNRESTRICTED FUNDS**

For the Years Ended December 31, 1973 and 1972

	<u>1973</u>	<u>1972</u>
FUNDS PROVIDED:		
Loss from operations (includes depreciation funded in accordance with requirements of New York State and Associated Hospital Service of New York)	\$(5,625,623)	\$(2,380,426)
Non-operating revenues	4,536,840	4,818,273
Transfers from restricted funds for additions to plant, property and equipment	3,354,590	4,989,934
Sale of investments of non-current unrestricted funds	3,548,509	11,985,664
Loan repayment by restricted building funds	800,000	
Total funds provided	<u>6,614,316</u>	<u>19,413,445</u>
FUNDS APPLIED:		
Additions to plant, property and equipment	7,138,896	9,187,015
Decrease in long-term debt	638,390	284,315
Transfers to restricted funds	55,209	11,420
Loan to restricted building funds		6,000,000
Total funds applied	<u>7,832,495</u>	<u>15,482,750</u>
Increase (decrease) in working capital	(1,218,179)	3,930,695
Working capital, January 1	10,973,586	7,042,891
Working capital, December 31	<u>\$ 9,755,407</u>	<u>\$10,973,586</u>
Changes in components of working capital:		
Increase (decrease) in current assets:		
Cash	\$(2,406,377)	\$ 1,351,821
Investments	(954,556)	(156,546)
Accounts receivable	1,650,213	3,906,606
Inventories	447,953	282,229
Accrued interest and dividends receivable	(15,135)	(83,096)
Prepaid expenses	159,599	(11,171)
Decrease (increase) in current liabilities:		
Accounts payable	456,592	(178,984)
Accrued payroll and other expenses	(350,389)	(569,646)
Current portion of long-term debt	(389,653)	(59,784)
Due to specific purpose funds	183,574	(550,734)
Increase (decrease) in working capital	<u>\$(1,218,179)</u>	<u>\$ 3,930,695</u>

See Notes to Financial Statements.

EXHIBIT F

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

NOTES TO FINANCIAL STATEMENTS

December 31, 1973 and 1972

The Presbyterian Hospital in the City of New York follows fund accounting principles as are customary for similar not-for-profit entities. Significant accounting policies employed in applying such principles are as follows:

(a) Classification of funds

Funds classified as unrestricted represent funds available for any hospital purpose as distinguished from funds restricted externally for certain operating, endowment, and plant replacement and expansion purposes. The unrestricted replacement fund and unrestricted funds functioning as endowment represent funds appropriated by the Board of Trustees for certain specific purposes.

(b) Investments and related income

Investments acquired by purchase are carried at cost and those acquired by gift are carried at fair market value at the date of gift.

Realized gains or losses of restricted funds are distributed to the principal of the funds.

Unrestricted investment income and realized gains or losses of the unrestricted replacement fund and unrestricted funds functioning as endowment are reported as revenues (expenses) of the applicable funds. In accordance with a policy approved by the Board of Trustees, investment income is transferred to the general fund and realized gains or losses remain in the applicable funds.

(c) Plant, property and equipment

Plant, property and equipment are carried at cost less accumulated depreciation.

The straight line method of depreciation is utilized for all depreciable assets, except items of a movable nature. The latter assets, since 1966, are being depreciated on the double declining balance method.

Since January 1, 1953, in accordance with a policy approved by the Board of Trustees, the Hospital has followed the practice of funding depreciation by transferring cash equivalent to the annual provision for depreciation from the general fund to a replacement fund. Subsequent to December 31, 1969 such transfers were required by New York State and Associated Hospital Service of New York.

(d) Inventories

Inventories are carried principally at first-in, first-out cost.

(e) Unrestricted gifts

Unrestricted gifts designated by the Board of Trustees for particular purposes are reported as revenues of appropriate unrestricted funds.

(f) Pensions

The Hospital has a non-contributory retirement plan covering all active employees. The Hospital's policy is to fund pension cost accrued. There is no unfunded past service cost.

(g) Funds held in trust by others

Non-discretionary trusts held by others from which the Hospital receives income are not carried in the accounts of the Hospital.

The accompanying financial statements for 1973 have been prepared in accordance with accounting principles and practices set forth in the industry audit guide for hospitals issued by the American Institute of

EXHIBIT F (Continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

NOTES TO FINANCIAL STATEMENTS

December 31, 1973 and 1972

Certified Public Accountants which is applicable to financial statements for the year ended December 31, 1973. For purposes of comparison the 1972 financial statements included herein have been restated to give retroactive effect to such accounting principles and practices.

3. The Hospital's contributions to its retirement plan amounted to \$2,078,000 and \$1,999,000 in 1973 and 1972, respectively. The assets held in the Retirement Fund Trust and insurance company reserves exceeded the actuarially computed value of vested benefits as of January 1, 1973, the date of the latest actuarial valuation of the retirement plan.
4. Assets of the unrestricted replacement fund and unrestricted funds functioning as endowment have not been classified as current assets in the accompanying balance sheet, since such assets are not expected to be expended for current operating purposes during 1974.
5. Since 1960, assets of certain funds have been pooled for investment purposes and administered under the principles governing a common trust fund. Funds participating in such pool at December 31, 1973 and 1972 consisted of the following:

	<u>1973</u>		<u>1972</u>	
	<i>Carrying Values</i>	<i>Market Values</i>	<i>Carrying Values</i>	<i>Market Values</i>
Restricted funds	\$ 84,803,001	\$ 97,254,492	\$ 78,871,480	\$108,487,12
Unrestricted funds	22,359,848	27,839,764	25,853,498	36,489,19
Total	<u>\$107,162,849</u>	<u>\$125,094,256</u>	<u>\$104,724,978</u>	<u>\$144,976,31</u>

EXHIBIT G

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

**SCHEDULE OF ENDOWMENT FUNDS,
UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT
AND CERTAIN SPECIFIC PURPOSE FUNDS**

December 31, 1973

THE PRESBYTERIAN HOSPITAL:			
Adam, George Aubrey.....	\$ 3,378,244	Foote, Edwin Bancroft.....	255,067
Anonymous	189,607	Ford, George W. and Eliza Lawson..	479,710
Anonymous — For support of		Fowler, Dr. Edmund P., Memorial...	5,355
Residency Training	148,938	Fracture Endowment Fund.....	11,987
Arnstein, Daniel G.....	378,327	Fremstad, Anna Olivia.....	168,656
Atchley, Dr. Dana W.....	1,496,886	Frick, The Frances Dixon, Memorial..	50,386
Baker, Frances E.....	13,436	Gaisman, Henry J.....	75,839
Baker, Mrs. Frederick,		General Endowment.....	1,752,764
Pathological Department.....	12,323	Goldschmidt, Henry Philip.....	7,249
Briddon, C. K., Gold Medal.....	3,540	Gondran, Sophie M. and Adolph L...	144,966
Brookman, Henry D.....	72,483	Griffith, Griffith W. and Mary Jones,	
Bruenn, Dr. Howard G.....	47,523	Memorial	1,911,185
Cardiac Monitoring Fund of the		Haller, Maria L.....	3,782
Department of Medicine.....	110,968	Harkness, Edward S.....	8,971,669
Carle, Robert W., Endowed Room...	412,935	Harkness, Edward S., Memorial.....	6,465,921
Carle, Robert W. and Adele S.,		Harkness, Edward S., Research.....	1,082,655
Endowed Room.....	59,320	Harkness, Mary Stillman,	
Cary, Caroline Catherine.....	70,356	Memorial Endowment.....	341,986
Cary, The, Endowment Fund.....	135,825	Harkness, Mary Stillman,	
Coakley, Cornelius G.....	36,459	Memorial Research.....	63,520
Coakley, Cornelius G., Memorial.....	518,171	Harkness, The Mary S., for	
Coakley, Louise Perry.....	374,485	Convalescent Care.....	1,454,079
Colgate, Hannah, Memorial.....	87,583	Harkness, William Hale, Memorial...	55,155
Collins, Perry McDonough.....	795,864	Hartford, The John A. Foundation...	427,351
Columbia University for Vanderbilt		Hepatorenal Fund.....	33,113
Clinic and Sloane Hospital.....	1,980,354	Hill, Marguerite S.....	7,973
Commonwealth, The, Fund for		Hirschewitz, Blanche M.....	87,643
Eye Institute.....	603,629	Ingenthron, May A., Memorial Bed...	31,118
Cooper, Charles P. and Leonora P....	54,847	Institute of Ophthalmology, The.....	4,947,621
Cragin Fund.....	99,765	Ives, Helen Douglas.....	162,805
Davis, Isabel G.....	1,136,101	James Foundation of New York.....	665,053
Delano, Moreau.....	5,798	Jesup, Morris K. and Maria DeWitt...	144,966
Department of Surgery.....	95,832	Johnston, Andrew, Memorial Room...	58,323
Dodge, The Cleveland H.....	450,121	Jones, David, Memorial.....	434,900
Dortic Memorial.....	142,655	Jones, Margarette A.....	241,014
Dows, Mrs. David.....	11,162	Keller Memorial.....	725
Dows, Margaret E.....	7,771	Kennedy, John Stewart.....	1,395,701
Educational and Scientific Work....	413,920	Kinnicutt, The G. Herman, Flower...	7,249
Eichner, Joseph Herman and		Knapp, The Herman Memorial Eye	
Hannah, in Memory of.....	12,432	Hospital Endowed Bed.....	93,037
Eidlitz, Otto M.....	595,838	Kreisler, Harriet and Fritz.....	319,803
Eidlitz, Robert J.....	267,408	Krumb, Henry.....	29,839
Endowed Bed.....	3,199,449	Lattimer, Dr. John K.....	81,030
Endowed Bed — Research.....	261,379	Leifer, Dr. Edgar.....	75,098
Faulkner, The Edward Daniels		Lenz, Maurice.....	1,352
Memorial for Study and Treatment		Lindley, Erasmus C.....	60,293
of Arthritis.....	155,121	MacMillin, Isabel Memorial.....	1,951,752
Feldman, Irving J.....	26,241	Maloy, The Frank and Selena,	
Fiske, Fund.....	151,108	Memorial	30,147
FitzGerald, Frederick H.		Martin, Frederick Townsend.....	14,496
and Josephine F.....	196,362	Maxwell, Anna C., Memorial Library.	10,381
Flagler, Alice Manderlick.....	358,662	McCosh, Dr. Andrew J., Memorial...	145,245
		McCready, Jeanne Campbell.....	145,489

**SCHEDULE OF ENDOWMENT FUNDS,
UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT
AND CERTAIN SPECIFIC PURPOSE FUNDS**

Surgical Cancer Research.....	6,900
Surgical Fellowship.....	86,979
Taylor, Dr. Alfred S., Memorial.....	28,834
Taylor, Sarah A. Hard, Endowed Room.....	63,762
Terry, John T., in Memory of.....	59,098
Thacher, Frances Lake, Memorial....	20,212
Tod, J. Kennedy, Memorial.....	145,114
Tolfree, The Caroline O. and James E., Memorial.....	226,716
Urological Service Research.....	108,151
Valentine, Isaac E., Memorial.....	816,478
Van Norden, Kathryn L.....	3,782
Vanderbilt Clinic.....	1,247,992
Walden, Julia Carroll.....	204,369
Webster, Dr. Jerome P., Library of Plastic Surgery.....	82,224
Weinberg, Ruth F.....	203,828
Weinberg, The Sidney J., Employees Educational Aid.....	219,246
Weinman, Moses.....	7,719
Weisl, Alice.....	460,031
Welles, Frances Swan.....	14,496
Westlake, Emory H. and Caroline B...	48,049
Wheeler, The Dr. John M., Memorial..	108,098
Williams, William.....	488,127
Total	67,749,975

Cleft Palate Cases.....	10,310
Cribside Social Service Committee....	18,597
Educational Therapy.....	1,450
Eichner, Joseph Herman and Hannah, in Memory of.....	12,432
Endowed Bed.....	59,748
General Endowment.....	13,135
Harkness, Edward S.....	1,739,271
Harkness, Edward S., Educational and Scientific.....	869,795
Harkness, Mary Stillman, Memorial Endowment.....	341,986
Kimball, Reuel B.....	83,701
Lambert, Dr. Charles I., Memorial....	13,135
McIntosh, Rustin.....	62,315
Pratt, Samuel.....	57,275
Rathbone, R. Bleecker.....	21,600
Rumson Fund.....	29,674
Singer, Dr. Milton.....	85,115
Urological Service Research.....	6,590
Videre, Leontine, Foundation.....	14,454
Wilcox, Herbert B., Memorial.....	4,547
TOTAL	3,445,152

EXHIBIT G (Continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

**SCHEDULE OF ENDOWMENT FUNDS,
UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT
AND CERTAIN SPECIFIC PURPOSE FUNDS**

December 31, 1973

NEUROLOGICAL INSTITUTE:			
Blair Memorial.....	4,533	Watson, Emily A.....	3,627,429
Endowed Bed — Research.....	221,748	White, Emily Vanderbilt.....	28,696
Hendricks, Helen R. and Frank, Ethel H.....	461,388	Willard, Mary Livingston.....	7,249
Masselink, Dr. R., Memorial.....	5,585	TOTAL	7,639,279
Neurological Institute Auxiliary.....	16,966	TOTAL	\$80,075,830
Ogilvie, Clinton, Memorial.....	14,453	ENDOWMENT FUNDS (Exhibit A).....	\$60,064,733
Schlesinger, Dr. Edward B.....	69,447	UNRESTRICTED FUNDS FUNCTIONING AS ENDOWMENT (Exhibit A).....	11,993,005
Sciarra, Madeline.....	304,370	SPECIFIC PURPOSE FUNDS (exclusive of \$4,271,180 not included in the Hospital's investment pool) (Exhibit A).....	8,018,092
Zabriskie, Dr. Edwin G., Memorial.....	142,930	TOTAL	\$80,075,830
TOTAL	1,241,420		
NEW YORK ORTHOPEDIC HOSPITAL:			
Bridgman, Statira.....	3,624		
Carroll, Dr. Robert E., Research.....	15,758		
Endowed Bed.....	899,113		
Farrell, Dr. Benjamin P., in Memory of.....	10,394		
General Endowment.....	1,207,947		
Hallock, Dr. Halford, Fellowship.....	16,368		
Hibbs, Russell A., Memorial Library.....	77,854		
Hurst, The Thomas D. and Kate.....	7,249		
Kane, Annie C., Fellowship.....	1,449,663		
Lantzounis, Dr. Leonidas A., Fellowship.....	15,658		
Orthopedic Surgery Endowment.....	198,197		
Rathbone, R. Bleecker.....	21,606		
Smith, Dr. Alan DeForest, Lectureship.....	8,159		
Tower, Mary T., in Memory of.....	44,315		

In addition to the above, the Hospital also receives income from the following non-discretionary trusts held by others:

<u>Trusts</u>	<u>Market Values, December 31, 1973</u>
Danziger, Matilda.....	\$ 80,112
Gould, Edwin.....	14,776
Jackson, Peter A. H.....	463,365
Strong, W. E. S.....	689,221
Swan, Helen M. W.....	1,159,714
Zuhlke, Roberta L.....	1,587,588

AUDITORS' OPINION

THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

We have examined the following financial statements of The Presbyterian Hospital in the City of New York as of December 31, 1973 and 1972 and for the years then ended:

	<u>Exhibit</u>
Balance Sheet	A
Statement of Operating Revenues and Expenses	B
Statement of Revenues and Expenses and Changes in Unrestricted Fund Balances	C
Statement of Changes in Restricted Fund Balances	D
Statement of Changes in Financial Position of Unrestricted Funds	E
Notes to Financial Statements	F

We have also examined the schedule of endowment funds, unrestricted funds functioning as endowment and certain specific purpose funds (Exhibit G) as of December 31, 1973. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements (restated for 1972 as explained in Note 2) and supplemental schedule present fairly the financial position of the Hospital at December 31, 1973 and 1972 and the results of its operations and the changes in the financial position of unrestricted funds for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

New York, N.Y.
February 5, 1974

HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Haskins & Sells, as independent certified public accountants, to make an examination of the financial statements of The Presbyterian Hospital in the City of New York for 1973.

We submit herewith after due consideration by this Committee, an opinion of Haskins & Sells dated February 5, 1974 relating to the Corporation's following financial statements and supplemental schedule as of December 31, 1973 and the year then ended:

Financial Statements:	<u>Exhibit</u>
Balance Sheet	A
Statement of Operating Revenues and Expenses	B
Statement of Revenues and Expenses and Changes in Unrestricted Fund Balances	C
Statement of Changes in Restricted Fund Balances	D
Statement of Changes in Financial Position of Unrestricted Funds	E
Notes to Financial Statements	F
Supplemental Schedule:	
Schedule of Endowment Funds, Unrestricted Funds Functioning as Endowment and Certain Specific Purpose Funds	G

Your Committee recommends that the opinion, financial statements and supplemental schedule be accepted and approved.

New York
February 5, 1974

JOHN A. GIFFORD, *Chairman*
HULBERT S. ALDRICH
DORRANCE SEXTON
JAMES W. WALKER
ROBERT WINTHROP
Auditing Committee

EXHIBIT H

**GROUP RETIREMENT PLAN ESTABLISHED BY
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK**

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly by a Contract with The Travelers Insurance Company. The amount set aside for retirement benefit purposes, which are not a part of the assets of the Hospital, aggregated \$21,260,546 at December 31, 1973. The total pension expense for 1973 was \$2,078,000. The Hospital's policy is to fund pension cost accrued. The actuarially computed value of vested benefits as of January 1, 1973, the date of latest actuarial valuation of the Plan, was \$19,359,447. In accordance with the Hospital's undertaking under the Group Retirement Plan the amounts already set aside are sufficient to provide for all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled under the Plan. In addition, they include provision for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1973 under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1973 on the Retirement Fund Trust established by the Hospital:

Assets in Fund — January 1, 1973	\$15,062,249
Payments to Fund	2,078,000
Net Income from Investments including Net Profit on Investments Disposed of	477,531
	<u>17,617,780</u>
Disbursements for Retirement Benefits	763,320
Assets in Fund — December 31, 1973	<u>\$16,854,460</u>
Consisting of:	<i>Book Value*</i>
Industrial, Railroad, Public Utilities and Miscellaneous Bonds	\$ 2,633,232
Common Stocks — Equities	11,274,107
Commingled Pension Trust Funds:	
Mortgage — Real Property	1,021,275
Special Situation Investments — Convertibles	688,052
Special Situation Investments — Equities	813,769
Special Situation Investments — Real Estate	494,939
Cash	<u>(70,914)</u>
	<u>\$16,854,460</u>

* The cash and approximate market value of securities held as of December 31, 1973 totaled \$19,495,590.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,

Trustee

By ARNOLD E. SIGLER,

Assistant Vice President

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1973:

Retirement Fund Trust—Morgan Guaranty Trust Company of New York, Trustee	\$16,854,460
Retirement Plan reserves held by Travelers Insurance Company	4,406,086
	<u>\$21,260,546</u>

STATISTICS

Year 1973

	<i>Bed Com- plement(*)</i>	<i>Admissions</i>	<i>Patient Days Care</i>
PRIVATE:			
Presbyterian Hospital (Harkness Pavilion)	220	6,301	72,548
Edward S. Harkness Eye Institute	19	660	4,220
Neurological Institute	63	1,065	20,606
Sloane Hospital	24	806	4,512
Total Private	<u>326</u>	<u>8,832</u>	<u>101,886</u>
SEMI-PRIVATE:			
Presbyterian Hospital and Sloane Hospital:			
All services (Harkness)	104	2,994	34,772
Dermatology	8	117	2,005
Gynecology	13	369	3,962
Hypertension	8	121	1,581
Obstetrics	18	963	4,305
Orthopedic	77	1,160	19,660
Otolaryngology	21	1,212	5,969
Surgery	48	767	13,700
Urology	31	701	8,370
Babies Hospital (including neonatal special care unit of 23 incubators)	164	2,750	30,377
Edward S. Harkness Eye Institute	57	2,343	15,468
Neurological Institute	89	903	24,919
Total Semi-Private	<u>638</u>	<u>14,400</u>	<u>165,088</u>
WARD:			
Presbyterian Hospital and Sloane Hospital:			
Abortion Unit	8	939	939
Admitting	14	750	2,745
Gynecology	35	700	7,128
Medicine	101	2,261	31,515
Obstetrics	57	2,642	14,610
Orthopedic	45	1,145	16,887
Otolaryngology	12	350	2,351
Surgery	77	1,823	20,609
Urology	36	1,000	10,439
Babies Hospital(†)	—	2,184	21,189
Edward S. Harkness Eye Institute	24	824	5,177
Neurological Institute	98	1,229	26,257
Total Ward	<u>507</u>	<u>15,847</u>	<u>159,846</u>
Total	<u>1,471</u>	<u>39,079</u>	<u>426,820</u>
NEWBORNS (Sloane Hospital):			
Private beds	24	377	1,819
Semi-Private and Ward beds	48	2,684	13,108
Total	<u>72</u>	<u>3,061</u>	<u>14,927</u>

(*) As of December 31.

(†) Reclassified from Ward to Semi-Private September 15, 1973.

OUT-PATIENT DEPARTMENT STATISTICS

Summary of Patients Treated:	1973	1972
Number of patients treated	58,274	61,727
Number of visits:		
Medicare	57,122	55,655
Medicaid	176,180	172,937
Associated Hospital Service	6,935	5,776
Full Pay	5,952	6,007
Part Pay	116,171	128,690
Personnel and Dependents	11,878	11,575
Free	13,845	12,689
Transfers	4,326	4,129
Follow-ups	1,911	2,377
Charges and Miscellaneous Agencies	31,177	33,059
Total	425,497	432,894
Average visits per work day	1,682	1,792

Attendance Statistics:	New to Clinics	Revisits	Total Visits
Dermatology	7,600	13,292	20,892
Emergency and Admitting Ward	22,608	27,148	49,756
Group Clinic	3,061	20,176	23,237
Medicine	5,662	27,466	33,128
Neurology	2,314	11,655	13,969
Obstetrics and Gynecology	16,744	25,721	42,465
Ophthalmology	6,996	23,234	30,230
Orthopedic	12,883	20,387	33,270
Otolaryngology	5,845	10,038	15,883
Pediatrics	24,727	36,792	61,519
Physical Medicine and Rehabilitation	352	10,631	10,983
Psychiatry	912	10,881	11,793
Surgery	22,982	45,560	68,542
Urology	1,233	8,597	9,830
Total	133,919	291,578	425,497

PERSONNEL STATISTICS

	On Duty December 31	
	1973	1972
Administration	16	16
Assistant Secretary-Treasurer	111	112
Comptroller	210	205
Public Interest	29	24
Non-professional services:		
Buildings and grounds	659	660
Food service	334	341
Personnel and protective	118	116
Other non-professional services	175	169
Professional services:		
Nursing	1,862	1,829
Professional staff, doctors' offices and research	575	502
Special services	846	839
Vanderbilt Clinic and other	449	456
Total	5,384	5,269
Student:		
Department of Nursing, Faculty of Medicine, Columbia University	325	288
Columbia-Presbyterian School of Practical Nursing	76	61
Presbyterian Hospital School of:		
Radiologic Technology	30	28
Operating Room Technology	6	9
Orthoptic and Ophthalmic Assistants	3	3
Electroencephalographic Technology	5	3
Total	445	392

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

(Including Cribside Social Service Committee)

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1973 and 1972

	1973	1972
Balance, January 1	\$ 4,960.38	\$ —
Receipts:		
Membership dues	1,205.00	1,260.00
Interest on investments	1,001.24	999.45
Greater New York Fund	14,697.00	14,107.00
United Hospital Fund:		
Free Care Distribution	5,779.00	6,980.00
Direct Benefit	11,071.00	10,653.00
Everybody's Thrift Shop	18,024.65	16,914.69
Donations	4,060.00	2,215.00
Payments by Patient Care, etc.	15.00	—
Theater Benefit receipts	—	21,730.00
Net Income from Theater Benefit—Transfer to Discretionary Fund	—	(11,212.01)
Total Receipts	\$55,852.89	\$63,647.13
Disbursements:		
Used for the care of Ward and Clinic Patients	11,071.00	10,653.00
Emergency Nursing Fund	4,000.00	4,000.00
Pediatric Psychiatric Clinic	1,500.00	1,500.00
Volunteers	500.00	500.00
Others	309.87	269.84
Special Projects—Thrift Shop Expenditures, Benefit, etc.	1,935.00	9,723.99
Recreational Therapy	4,500.00	5,500.00
Social Service Expenditures	27,456.14	26,539.92
Total Disbursements	51,272.01	58,686.75
Balance, December 31	\$ 9,541.26	\$ 4,960.38

EMERGENCY NURSING FUND—BABIES HOSPITAL

Balance, January 1	\$ 9,288.87	\$ 5,317.47
Receipts:		
Board of Women Managers of Babies Hospital	4,000.00	4,000.00
Donations	4,875.00	2,114.65
Total Receipts	8,875.00	6,114.65
Disbursements:		
For Pediatric Nurse Practitioner	11,000.00	—
Other	515.77	2,143.25
Total Disbursements	11,515.77	2,143.25
Balance, December 31	\$ 6,648.10	\$ 9,288.87

DISCRETIONARY FUND OF THE BABIES HOSPITAL BOARD OF WOMEN MANAGERS

Balance, January 1	\$37,181.04	\$ —
Receipts:		
Donations	2,200.00	33,018.55
Theater Benefit	16,460.00	11,212.01
Total Receipts	18,660.00	44,230.56
Disbursements:		
Benefit Expenses	7,624.10	—
Salaries, Recreational Therapist, etc.	2,574.89	1,049.52
Refurbishing Pediatric Clinic	—	6,000.00
Total Disbursements	10,198.99	7,049.52
Balance, December 31	\$45,642.05	\$37,181.04

M. FRANCIS MOFFAT, *Treasurer*

NEUROLOGICAL INSTITUTE AUXILIARY
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1973 and 1972

	<u>1973</u>	<u>1972</u>
Balance, January 1	\$13,322.90	\$14,285.54
Receipts:		
Interest on investments	169.82	169.51
Donations and membership dues	7,213.10	13,975.00
United Hospital Fund:		
Free Care Distribution	5,185.00	6,262.00
Direct Benefit	19,441.00	17,196.00
Greater New York Fund	13,187.00	12,658.00
Everybody's Thrift Shop	14,060.64	12,614.25
Payments by patients of advances and loans	239.20	952.00
Receipt for prior year expenditure for Research Psychologist	—	5,500.00
Total Receipts	<u>59,495.76</u>	<u>69,326.76</u>
	<u>72,818.66</u>	<u>83,612.30</u>
Disbursements:		
Social service salaries	16,563.82	15,949.63
To Neurological Institute for:		
Care of clinic and ward patients	19,441.00	17,196.00
Library	7,234.34	7,000.08
Social service scholarships	—	1,000.00
Volunteer service	1,900.00	1,900.00
Recreational therapist	—	2,278.12
Nurse specialist—Neurology Clinic	3,675.00	3,675.00
Multiple sclerosis grant	1,000.00	—
Social service salary for college student	—	1,075.08
Patient care study	—	870.00
Social services expenditures for patients:		
Summer camps	8,192.25	14,617.50
Transportation	1,678.42	1,477.65
Medical appliances and maintenance	672.15	415.95
Clothing	86.75	60.00
Homemaker	951.95	551.20
Other	14.55	86.25
Staff travel	182.10	119.90
Everybody's Thrift Shop	500.00	1,020.90
Miscellaneous, postage, telephone and publications	351.92	996.14
Total Disbursements	<u>62,444.25</u>	<u>70,289.40</u>
Balance, December 31	<u>\$10,374.41</u>	<u>\$13,322.90</u>

MARJORIE CHADSEY, *Treasurer*

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1973 and 1972

	<u>1973</u>	<u>1972</u>
Balance, January 1	\$10,307.90	\$15,292.09
Receipts:		
Donations	6,410.52	10,113.52
Investment Income used in Recreational Therapy	2,010.85	2,007.30
United Hospital Fund:		
Direct Benefit	19,136.00	19,692.00
Free Care Distribution	2,456.00	2,965.00
Greater New York Fund	6,244.00	5,993.00
Total Receipts	<u>36,257.37</u>	<u>40,770.82</u>
	46,565.27	56,062.91
Disbursements:		
Recreational therapist salary	10,318.67	21,524.08
Other recreational therapy expenses	535.62	561.28
To Presbyterian Hospital for:		
Care of Ward and Clinic patients	19,136.00	19,692.00
Library	2,711.03	2,633.35
Volunteer Service	1,100.00	1,100.00
Miscellaneous	288.20	244.30
Total Disbursements	<u>34,089.52</u>	<u>45,755.01</u>
Balance, December 31	<u>\$12,475.75</u>	<u>\$10,307.90</u>

JOYCE MANN, *Treasurer*

Gifts and Bequests

The activities of the Medical Center are supported to a substantial extent by the income from bequests of friends who desire to insure the continuation of their help to the sick.

Depending upon the wishes of the donor or the objects and purposes of the gift, gifts or bequests may be made to any one of the following:

Columbia-Presbyterian Medical Center Fund, Inc.

The Trustees of Columbia University in the City of New York for the use of its College of Physicians and Surgeons.

The Presbyterian Hospital in the City of New York.

Bequests may be made in the following form:

Form of Bequest *I give and bequeath to _____ the sum of _____ dollars (\$ _____) to be applied to the use and benefit of said corporation, under the direction of the Trustees thereof.*

In case it is desired to specify the particular use to which the bequest is to be put, such use may be specified in place of the words "*to be applied to the use and benefit of the said corporation, under the direction of the Trustees thereof.*" in the form of bequest given above.

In case it is desired to make the bequest as a memorial, "*in memory of _____*" may be added to the form of bequest.

The Presbyterian Hospital in the City of New York, by reason of the consolidation of its constituent hospitals at the Medical Center, will receive gifts made to The Presbyterian Hospital in the City of New York, to the Babies Hospital of the City of New York, to Neurological Institute of New York and to New York Orthopaedic Dispensary and Hospital. It is, therefore, not necessary to change the provision of any will naming any of the foregoing constituent hospitals as a beneficiary. Of course, a gift or bequest to The Presbyterian Hospital in the City of New York may specify that it is to be used for the benefit of any one of the foregoing constituent hospitals or for any other purpose.

Columbia University's College of Physicians and Surgeons including its School of Nursing and School of Public Health encompass a variety of teaching and research programs. A gift or bequest to the College of Physicians and Surgeons may specify that it is to be applied to any one of the many programs mentioned in the body of the report or for general educational and research purposes of the College of Physicians and Surgeons.

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1973 and 1972

	<u>1973</u>	<u>1972</u>
Balance, January 1	\$22,585.31	\$10,027.80
Receipts:		
Membership dues	1,238.00	1,153.00
United Hospital Fund:		
Free Care Distribution	3,259.00	3,936.00
Direct Benefit	14,703.00	23,923.00
Greater New York Fund	8,288.00	7,955.00
Auxiliary Benefit	5,852.00	—
Stuyvesant Square Thrift Shop	24,960.29	25,634.61
Total Receipts	<u>58,300.29</u>	<u>62,601.61</u>
	<u>80,885.60</u>	<u>72,629.41</u>
Disbursements:		
To Presbyterian Hospital:		
Care of Ward and Clinic patients	14,703.00	23,923.00
Library	10,050.00	10,050.00
Volunteer Service	7,200.00	7,620.00
Recreational Therapy	7,499.49	6,130.30
Student Nurse Scholarship Fund	500.00	500.00
Anna Ball Kneeland Memorial Fund for Staff Development in Social Service ..	715.00	500.00
Emily Webster Fund	500.00	500.00
Auxiliary Benefit	5,171.29	—
Miscellaneous	1,198.69	820.80
Total Disbursements	<u>47,537.47</u>	<u>50,044.10</u>
Balance, December 31	<u>\$33,348.13</u>	<u>\$22,585.31</u>

ANNA BALL KNEELAND MEMORIAL FUND
FOR STAFF DEVELOPMENT IN SOCIAL SERVICE

For the Years Ended December 31, 1973 and 1972

	<u>1973</u>	<u>1972</u>
Balance, January 1	\$ 177.78	\$ 1,191.53
Receipts:		
Women's Auxiliary of The Presbyterian Hospital	715.00	500.00
Other	200.00	110.00
Total Receipts	<u>915.00</u>	<u>610.00</u>
	<u>1,092.78</u>	<u>1,801.53</u>
Disbursements:		
Seminar and Staff Development	780.00	730.00
Spanish Lessons and Books for Social Service Staff	—	893.75
Total Disbursements	<u>780.00</u>	<u>1,623.75</u>
Balance, December 31	<u>\$ 312.78</u>	<u>\$ 177.78</u>

CAROLYN A. BUDA, Treasurer

EXHIBIT A

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

BALANCE SHEET

December 31, 1973 and 1972

	1973	1972
ASSETS		
CURRENT FUNDS ASSETS:		
Cash	\$ 372,645	\$ 104,259
Bonds and stocks—at cost or contributed value (quoted market value—1973, \$2,787,495; 1972, \$240,952)	2,790,474	240,798
Interest and dividends receivable	75,083	21,059
TOTAL CURRENT FUNDS ASSETS	<u>3,238,202</u>	<u>366,116</u>
ENDOWMENT FUNDS ASSETS:		
Cash	2,993	1,946
Bonds and stocks—at cost or contributed value (quoted market value—1973, \$3,190,328; 1972, \$3,778,076)	3,759,091	3,681,534
TOTAL ENDOWMENT FUNDS ASSETS	<u>3,762,084</u>	<u>3,683,480</u>
TOTAL	<u>\$7,000,286</u>	<u>\$4,049,596</u>
FUNDS AND LIABILITIES		
CURRENT FUNDS AND LIABILITIES:		
Accrued expenses and accounts payable	\$ 20,050	\$ 5,697
Bank loan payable (10%, due 4/1/74)	75,000	
Special expendable funds	3,106,621	297,351
General fund	36,531	63,068
TOTAL CURRENT FUNDS AND LIABILITIES	<u>3,238,202</u>	<u>366,116</u>
ENDOWMENT FUNDS	<u>3,762,084</u>	<u>3,683,480</u>
TOTAL	<u>\$7,000,286</u>	<u>\$4,049,596</u>

NOTES:

The Columbia-Presbyterian Medical Center Fund, Inc. was established January 21, 1960 to obtain funds to be used for the joint educational, scientific and charitable purposes now carried on by The Presbyterian Hospital in the City of New York and The Trustees of Columbia University in the City of New York through the Columbia-Presbyterian Medical Center.

The Fund's financial statements do not include amounts contributed directly to Columbia University or The Presbyterian Hospital in the City of New York for the development of the Columbia-Presbyterian Medical Center.

The Fund follows fund accounting principles as are customary for not-for-profit entities.

EXHIBIT B

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

STATEMENT OF CHANGES IN FUND BALANCES

For the Years Ended December 31, 1973 and 1972

GENERAL FUND

	1973	1972
Balance, January 1	\$ 63,068	\$ 120,518
Add:		
Unrestricted contributions and legacies	303,995	83,269
Investment income	15,843	4,894
TOTAL	319,838	88,163
Deduct—Fund raising expenses for Columbia-Presbyterian Medical Center development program:		
Professional fund raisers fees	149,475	
Secretarial and clerical staff	104,248	47,090
Other expenses	90,742	44,125
TOTAL	344,465	91,215
Unrestricted contributions, legacies and investment income over (under) expenses	(24,627)	(3,052)
TOTAL	38,441	117,466
Add (Deduct) Grants and Transfers—Net:		
Grants to Columbia University	(5,086)	(57,410)
Grants to Presbyterian Hospital	(2,952)	(67,470)
Transfer from special expendable funds	6,128	70,482
Net	(1,910)	(54,398)
Balance, December 31	\$ 36,531	\$ 63,068

SPECIAL EXPENDABLE FUNDS

(For Construction, Faculty Salaries and Other Purposes)

Balance, January 1	\$ 297,351	\$ 336,368
Add:		
Contributions and legacies	5,381,469	51,431
Investment income	192,272	163,723
TOTAL	5,573,741	215,154
TOTAL	5,871,092	551,522
Deduct:		
Grants to:		
Presbyterian Hospital:		
For construction purposes	2,031,598	32,852
For faculty salaries	28,758	19,582
For other purposes	20,000	
Columbia University:		
For construction purposes	543,631	
For faculty salaries	99,408	95,468
For professorship	30,000	35,000
For other purposes	4,000	
Transfer to general fund	6,128	70,482
Transfer to endowment funds	948	787
TOTAL	2,764,471	254,171
Balance, December 31	\$3,106,621	\$ 297,351

EXHIBIT B (Continued)

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

STATEMENT OF CHANGES IN FUND BALANCES

For the Years Ended December 31, 1973 and 1972

ENDOWMENT FUNDS

	1973	1972
Balance, January 1	<u>\$3,683,480</u>	<u>\$3,793,821</u>
Add (Deduct):		
Net gain (loss) on sales of securities	76,656	(111,178)
Contributions	1,000	50
Transfer from special expendable funds	948	787
	<u>78,604</u>	<u>(110,341)</u>
Balance, December 31	<u>\$3,762,084</u>	<u>\$3,683,480</u>

EXHIBIT C

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

SCHEDULE OF ENDOWMENT FUNDS

December 31, 1973

Anesthesiology, Fund for Endowed Chair in.....	\$ 20,833
Auchincloss, Dr. Hugh, Memorial Endowment Fund.....	669,201
Commonwealth Fund Endowment for Faculty Uses.....	2,502,053
General Endowment Fund	545,850
Webster Library Endowment Fund.....	24,147
TOTAL ENDOWMENT FUNDS	<u>\$3,762,084</u>

AUDITORS' OPINION

COLUMBIA-PRESBYTERIAN
MEDICAL CENTER FUND, INC.:

We have examined the balance sheet of Columbia-Presbyterian Medical Center Fund, Inc. as of December 31, 1973 and the related statement of changes in fund balances for the year then ended and the supplemental schedule of endowment funds. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements and supplemental schedule present fairly the financial position of the Fund at December 31, 1973 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS & SELLS
Certified Public Accountants

New York, N.Y.
March 5, 1974

COLUMBIA UNIVERSITY-PRESBYTERIAN HOSPITAL
SCHOOL OF NURSING ALUMNAE ASSOCIATION, INC.
STATEMENT OF ASSETS, LIABILITIES AND FUNDS

December 31, 1973 and 1972

ASSETS

	1973	1972
Capital Funds—securities and cash	\$1,276,871.77	\$1,248,921.23
Operating Funds—securities, cash and accrued dividends and interest receivable	55,464.46	48,808.14
Total Assets	<u>\$1,332,336.23</u>	<u>\$1,297,729.37</u>

LIABILITIES AND FUNDS

Capital Fund Reserves:		
General Fund	\$ 77,297.69	\$ 73,686.15
Benefit Fund	265,841.80	260,807.33
Pension Fund	777,533.54	762,806.16
Helen Young Memorial Fund	9,389.27	9,210.79
Dominick Fund for Needy Members	5,294.39	5,193.12
Scholarship Funds:		
Josephine C. Brown Fund	3,038.29	2,785.25
Janet B. Christie Fund	4,735.31	4,448.51
Helen Cunningham Fund	3,736.90	3,469.38
M. Elizabeth Deans Howell Fund	3,191.18	3,033.32
Dorothy DeGraff Keim Fund	3,786.93	3,569.41
Emma B. Kennedy Fund	45,886.27	45,018.30
Ethel Burnham Kernohan Fund	2,592.34	2,444.12
Memorial Fund '20	6,384.59	6,264.04
June Moore Fund	3,043.85	2,790.81
Sarah C. Nadel Fund	2,203.73	1,965.15
Richard William Walsh Fund	3,630.98	3,463.47
Ruth C. Williams Fund	6,847.16	6,619.38
Helen Young Fund	52,437.55	51,346.54
Total Capital Fund Reserves	1,276,871.77	1,248,921.23
Operating Funds Reserves	54,658.42	46,687.82
Liabilities	806.04	2,120.32
Total Liabilities and Funds	<u>\$1,332,336.23</u>	<u>\$1,297,729.37</u>

SUMMARY OF RECEIPTS AND DISBURSEMENTS

Cash Balance, January 1	\$ 36,828.66	\$ 13,191.12
Receipts:		
Sale of securities	436,991.93	448,219.85
Investment income	70,811.61	65,669.88
Donations	13,469.93	14,457.38
Dues and initiation fees	21,885.00	22,596.50
Miscellaneous	4,647.35	5,575.17
Total Receipts	547,805.82	556,518.78
	584,634.48	569,709.90
Disbursements:		
Purchase of securities	450,112.19	438,299.61
Clerical expense and fees	16,209.00	13,771.00
Pensions and benefits paid	47,805.00	48,780.00
Scholarships granted	11,124.88	10,367.20
Printing, stationery and postage	11,605.65	10,078.32
Miscellaneous	15,644.14	11,585.11
Total Disbursements	552,500.86	532,881.24
Cash Balance, December 31	<u>\$ 32,133.62</u>	<u>\$ 36,828.66</u>

MARGARET WELLS, *Treasurer*

Endowed Beds and Rooms

(1) A gift of \$10,000, specified for an endowed ward bed, shall entitle the donor to nominate a patient to use and occupy one bed in the common wards of the Hospital free of charge (except for special services) for not more than 90 days in any one year.

The donor may at the time of making the gift appoint to another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only: —

(a) During the life of the person having the right to nominate, if such right is in an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

(2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment and discharge of patients.

(3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the objectives for which the Hospital was established and is maintained.

(4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

A gift of \$10,000 shall entitle the donor to establish as a permanent memorial one memorial endowed bed for research purposes in a ward of the Hospital to be used and occupied by patients free of charge, except for special service.

The President of the Medical Board shall, subject to the approval of the President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes for not more than ninety days in any one year for a period of fifteen years, subject to all rules and regulations governing the admission, treatment and discharge of patients. This privilege shall be assigned to the persons occupying these respective offices (President of the Medical Board and President of the Hospital) at the time the nomination is made.

ENDOWED ROOMS

The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of rooms on such terms and conditions as they may deem best calculated to promote the objectives for which the Hospital was established and is maintained.

Endowed Beds and Rooms

Presbyterian Hospital

- 1868 Mary J. Gelston
- 1870 Henrietta A. Lenox (2 Beds)
Washington R. Vermilyea
A. R. Wetmore
- 1871 Estate of John Laurie
Mary Ann Parish

- 1872 William Earl Dodge
John T. Johnston
Otis D. Swan
Henry Young (2 Beds)
- 1873 James Brown (2 Beds)
John R. Ford
Jonathan Sturges
- 1878 James G. and Henry G. deForest, in memory of
Lockwood deForest Woodruff, M.D.
- 1880 William C. Rhinelander
- 1881 Jennet L. and Robert L. Belknap, in memory of
Aaron B. Belknap
Fifth Avenue Presbyterian Church
Henry B. Hyde, in memory of his son,
Henry B. Hyde, Jr.
John Stewart Kennedy
Frederick and Henry G. Marquand
Edwin D. Morgan (3 Beds)
Mary L. Sheafe
John L. Proudfit
- 1882 Heber R. Bishop (3 Beds)
Mrs. Robert L. Stuart, in memory of her father,
Robert McCrea
Edwin D. Morgan
Mrs. Moses Taylor
- 1883 Frederick Billings
Reformed Protestant Dutch Church of the
City of New York
- 1884 Rev. Nathaniel W. Conkling, D.D.
West Presbyterian Church, to be known as the
"Faith Presbyterian Church Bed"
Madison Square Presbyterian Church, in memory
of George W. Lane
- 1885 Brick Presbyterian Church, in memory
of Dr. John G. Adams
Richard Irvin
- 1886 Frederick Baker, in memory of
Sarah Pyewell Baker
Estate of Dr. Edward Langdon Beadle
Brick Presbyterian Church, in memory of
Miss Ann Adams
Fourth Avenue Presbyterian Church Bed by Peter
Cumming, in memory of Francis P. Schoals
George E. Dodge
Horace F. Hutchinson, in memory of
Ellen B. Schoals
Mr. and Mrs. William D. Sloane, in memory of
their son, William D. Sloane, Jr.
Henry S. Wilson, in memory of his son,
Harry H. Wilson
- 1887 Fifth Avenue Presbyterian Church
- 1888 Broadway Tabernacle Society
Samuel Inslee, in memory of Kate J. Inslee
- 1889 John Sloane, in memory of his mother,
Euphemia Sloane
- 1890 Isaac V. Brokaw, in memory of Ernest B. Brokaw
Sidney Dillon, in memory of Hannah Dillon
Ambrose K. Ely
Josiah M. Fiske
Oliver Burr Jennings

- Mrs. John Stewart Kennedy
Amelia Kerr
Fourth Presbyterian Church by Estate of
Robert Marshall
Elizabeth D. and Emily M. Wheeler, in memory
of James Boorman, to be known as
"The Davenport Bed"
- 1891 Hector C. Havemeyer Bed, by
Sarah A. Havemeyer, in memory of her son
Estate of Thomas Hope
Mrs. A. R. Van Nest, in memory of her husband,
Abram R. Van Nest
- 1892 John Stewart Kennedy, in memory of his niece,
Emma Stewart Baker
Alexander Maitland, in memory of his mother,
Mary C. Maitland
- 1893 Maria S. Auchincloss, in memory of her husband,
Edgar S. Auchincloss
Frances T. Lord, in memory of her husband,
George deForest Lord
Presbyterian Church on University Place
Presbyterian Home for Aged Women
Margaret A. Sinclair, in memory of her parents,
Mr. and Mrs. James Sinclair
West Presbyterian Church
Young Men's Christian Association
- 1895 Matilda A. Brown, in memory of her son,
H. Auchincloss Brown
Mary Harrison
Mrs. Clarence M. Hyde, in memory of her mother,
Rebecca Babbitt
John Stewart Kennedy, in memory of
Mrs. Robert L. Stuart
Mrs. James T. Murray, in memory of her husband,
James T. Murray
- 1896 Anthony Dey, in memory of Joseph G. and
Eliza D. Scott
Jane Hope
Esther J. Jennings, in memory of her husband,
Oliver B. Jennings
- 1897 Mrs. Frances E. Baker, in memory of her father,
James Rich Steers
William Smith Brown
Helen Miller Gould, in memory of her parents,
Mr. and Mrs. Jay Gould
Margarette E. and Susan D. Griffith, in memory of
their father, Griffith W. Griffith
Mary J. Griffith, in memory of her husband,
Griffith W. Griffith
Rachael L. Kennedy, in memory of her mother,
Mrs. Rachael C. Kennedy
Annie S. Paton, in memory of her husband,
William Paton
Charlotte H. Skidmore, to be known as
"The William L. Skidmore Bed"
- 1898 Brick Presbyterian Church
First Presbyterian Church
Mrs. Stephen V. Harkness, in memory of her
daughter, Florence Harkness
Jane Hope, in memory of her mother,
Grace Corrie Hope
John Stewart Kennedy, in memory of
Rev. William G. Schaufler, D.D., LL.D.
- Mrs. Elliott F. Shepard, in memory of her
daughter, Florence Vanderbilt Shepard
Mrs. Elliott F. Shepard, in memory of her
daughter, Marguerite Vanderbilt Shepard
- 1899 William W. Cole, in memory of his mother,
Mary A. Cole
Estate of William Whitewright, in memory of his
father, William Whitewright, "The Whitewright
Beds" (10 Beds)
- 1900 Emily B. Hopkins, in memory of her husband,
Moses Hopkins, "Moses Hopkins Memorial"
Donald MacKay, in memory of his children,
Edith Winslow and Walter Wise MacKay
Caroline L. Macy, in memory of her daughter,
Mary M. K. Willets
Estate of Alexander M. Proudfit, to be known as
the "John McLean Proudfit Bed"
Laura Roome, in memory of her sons,
Harry and Alfred Roome
Martha L. St. John, in memory of her mother,
Sarah Ward
Nathaniel Whitman
- 1901 Julia Billings, in memory of her husband,
Frederick Billings
Camilla L. Edwards, in memory of her husband,
Walter Edwards
Andrew J. Garvey, in memory of his mother,
Elizabeth Jeffries Garvey (2 Beds)
George Lauder
Charles H. Marshall
John E. Parsons, in memory of his children,
E.L.P., K.M.P., and R.M.P.
Justine Adele Stafford, in memory of her father,
Justin A. Bliss
- 1902 Robert Graham Dun
Margaret J. Plant, in memory of her brother,
Simon Loughman
- 1903 Heber R. Bishop
Laura Currier
Mrs. Francis B. Harrison
Julia J. MacCartee, in memory of her husband,
Robert MacCartee
Madison Avenue Reformed Church
Adele Berry Sloane, in memory of her father,
Abraham J. Beery, M.D.
Justine Adele Stafford, in memory of her mother,
Evelina C. Bliss
John T. Terry
- 1904 Virginia E. Fowler, in memory of
Clarence E. Fowler
Susan Bevier
Mrs. William Starr Miller
Josephine Penfold, in memory of
Dr. Edward Livingston Trudeau, Jr.
Peter Reid, in memory of his wife,
Jane Watson Reid
Francis A. Palmer
- 1905 Frederick G. Bourne
Mr. and Mrs. Albert H. Gallatin
Helen C. Inslee, in memory of her husband,
Samuel Inslee
Titus B. Meigs, in memory of his son,
Titus B. Meigs, Jr.

- Mrs. James T. Murray, in memory of
Rev. John Hall, D.D., LL.D.
Sarah J. Parsons, in memory of her husband,
Charles Parsons
Presbyterian Church on University Place
- 1906 Maria L. Campbell, in memory of
Henry Pearsall Campbell
Susan W. Duncan, in memory of her husband,
John P. Duncan
Samuel Keyser (3 Beds)
Sara Pyle McAlpin and James Tolman Pyle,
in memory of their father, William Scott Pyle
The Reformed Protestant Dutch Church in
Garden Street
John Sloane, in memory of his brother,
Thomas Chalmers Sloane
John Sloane, in memory of his father,
William Sloane
- 1908 William R. Craig, in memory of his sister,
Florence Faxon Craig
George B. Goldschmidt, in memory of his mother,
Celestine Goldschmidt
Samuel Anthony Goldschmidt, in memory of his
mother, Celestine Goldschmidt
Mrs. Stephen V. Harkness, in memory of her
husband, Stephen V. Harkness
Charles H. Marshall, Jr.
- 1909 Rev. and Mrs. Robert Russell Booth, in memory
of "Minnie and Willie"
Canadian Society of New York
Edward West Currier, in memory of his
stepmother, Laura Currier
Edward West Currier, in memory of his
stepbrother, Walter B. Currier
Edward West Currier, in memory of
Edward W. Currier
Estate of Mary Jane Johnson, in memory of her
husband, William H. Johnson
J. Theresa Keyser, in memory of her husband,
Samuel Keyser
Julia Hannon Lyle
Winfield Tucker, in memory of Joseph, Isabelle
and Adeline (3 Beds)
J. Spencer Turner, in memory of his first wife,
Cornelia J. Turner
- 1910 Jane A. Townsend, in memory of her son,
Randolph W. Townsend, Jr.
Jane A. Townsend, in memory of her son,
Harmon W. Norton
Jane A. Townsend, in memory of her daughter,
Emma L. Norton
Amelia Mott Graham, in memory of
Malcolm Graham
Adeline Ives Latham, in memory of her husband,
John Howard Latham
Estate of Josephine G. Lord, in memory of her
husband, Franklin B. Lord
- 1911 Brearley School Girls and others interested, in
memory of Madam Bertha Beck, the
"Madam Beck Memorial Teacher's Bed"
Harriet Coles, in memory of her sisters,
Susan and Anna Codman
Caroline Thorn Kissel, in memory of her husband,
Gustav Edward Kissel
- Katherine Spencer Leavitt, in memory of her
husband, Rev. William Leavitt (2 Beds)
Reformed Low Dutch Church of Harlem
Frederick Sturges, in memory of his father,
Jonathan Sturges
William Stewart Tod, in memory of his brother,
George Tod
- 1912 Melville de Wolf, in the Children's Ward,
the "Emma de Wolf Bed"
Gustavia A. Senff, in memory of her husband,
Charles A. Senff
Mrs. Christopher M. Bell, "The Dennistoun Bed"
- 1913 Cornelia Eaton, to be known as "The Dr. Reuben
S. Carpenter Memorial" (3 Beds)
Mrs. Jeremiah V. Meserole, in memory of her son,
Abraham Meserole
Josephine Penfold
Jane G. Phelps, in memory of her husband,
Anson G. Phelps, Jr. (2 Beds)
- 1914 Hugh D. Auchincloss, in memory of his mother,
Elizabeth Auchincloss
Jane Elizabeth Grannis, in memory of her mother,
"Charlotte Williams Platt Bed"
William H. Penfold, in memory of
Josephine Penfold
Louise Tillinghast, in memory of her sister,
Amelia C. Babcock
Estate of Minnie Hackett Trowbridge (5 Beds)
- 1915 A Friend, in memory of Sophia Kellogg Stebbins
and Mary Tompkins Kimball
A Friend
Mrs. Jeremiah V. Meserole, in memory of her
father-in-law, Abraham Meserole
Mrs. Jeremiah V. Meserole, in memory of her
husband, Jeremiah Vanderbilt Meserole
Mrs. Jeremiah V. Meserole, in memory of her
brother, Adolphus Clock
Mrs. Jeremiah V. Meserole, in memory of her
parents, Alfred and Anna Maria Clock
- 1916 Emil C. Bondy, in memory of
Margaret Carson Cowan
Central Presbyterian Church
Mr. and Mrs. James Petrie Chalmers, in memory
of James Petrie Chalmers, Jr., "The Chalmers
Memorial Bed"
Robert A. Chambers, in memory of his father,
Robert Chambers
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
William D. Sloane (3 Beds)
- 1917 Emeline Y. Danforth, in memory of
Mrs. William B. Jenkins
Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
Estate of Sarah C. Miller
Albert Winter, in memory of
Adaline Benson Winter
- 1918 Ida Leora Olmstead, to be known as the
"Leora McCammon Bed"
- 1919 Samuel Elliott
Elizabeth Keys, in memory of her daughter,
Edith Keys
Rutgers Presbyterian Church

- Estate of James R. Steers, in memory of his former wife, Rebecca E. Steers
Estate of John W. Sterling
- 1920 William C. Boschen, to be known as the "Boschen Bed"
Rosa Franklin (4 Beds)
Francis P. Furnald
Mrs. Francis P. Furnald
Mary A. Harriot, to be known as the "Margaret Harriot Alms"
Mary A. Harriot, to be known as the "James Harriot Alms"
Mrs. Henry O. Havemeyer, in memory of her parents, George William and Matilda Adelaide Elder
Estate of Margaret J. Orr, in memory of her mother, Ann Boyd Orr
Anna St. John, in memory of her brother, Milton St. John
- 1921 Mrs. Peter B. Wyckoff, to be known as the "Sidney Dillon Bed"
Henry M. Gescheidt
Ralph E. Prime, in memory of his daughter, Ruth Havens Prime
Joseph K. Gwynn
Charles S. Ward, in memory of his friend, Sophie L. Kinman
Charles S. Ward
- 1922 Minetta C. Howenstine (8 Beds)
Christina C. Munro, in memory of her husband, John Munro
Anna M. Romaine, in memory of Dr. William I. Detmold
Estate of Arnold Thayer (2 Beds)
Hamilton B. Tompkins, in memory of his wife and himself
- 1923 Lydia Augusta Brown
Josephine Newman Hall
- 1924 Bohemian Society "Lidumil"
Cordelia F. Turrell
Nannie Gyles Johnson, (Children's Ward), in memory of her son, Shirley Everton Johnson
Mrs. William John Fitzgerald
- 1925 Christina Bond, in memory of Julia C. Skidmore
George Clarke
Estate of Elizabeth J. Hofer, in memory of Catherine Parke and Horatio C. Kretschmar (2 Beds)
Edward M. Morgan Memorial Association, in memory of Edward M. Morgan (4 Beds)
Jennette Robertson, to be known as the "Helen C. Inslee Endowed Bed"
- 1926 Elizabeth Ellen Auchincloss, to be known as the "E. E. Auchincloss, Jr. Bed"
Members of the New York Stock Exchange, to be known as the "Seymour LeGrande Cromwell Memorial" (2 Beds)
Edmund Penfold, in memory of Josephine Penfold and William Hall Penfold (2 Beds)
Dr. and Mrs. M. Allen Starr, in memory of Allen Egbert Starr
- John B. Trevor, in memory of Emily N. Trevor
George D. Widener
- 1927 The Second Presbyterian Church in the City of New York
Ellen Mills Borne, in the Children's Ward, to be known as the "John E. Borne Bed" and the "Nellie M. Borne Bed" (2 Beds)
Virginia Marquand Monroe, in the name of the Young Men's Christian Association
Mrs. Charles H. Senff, to be known as the "Dr. George A. Tuttle Bed"
W. Frazer Gibson, in memory of his mother, Jeanette Frazer Gibson, to be known as the "Jeanette Frazer Gibson Bed"
Augustus C. Gurnee, in memory of his mother, Mary M. Gurnee (2 Beds)
Eliza V. Nicholson
Mrs. Murray W. Dodge and Mrs. Franklin Lord, in memory of their mother, Mrs. Fordyce D. Barker (Single Ward Room)
Dunlevy Milbank (Single Ward Room)
F. Ethel Wickham, in memory of her father, William Hull Wickham, to be known as the "William Hull Wickham Bed" (Single Ward Room)
Anna A. Johnston, in memory of her parents, William G. and Adriana C. Gardner
Anna A. Johnston, in memory of Lewis, Anna, Edward and Mary Johnston (Single Ward Room)
Broadway Presbyterian Church, to be known as the "Walter Duncan Buchanan Bed"
- 1928 North Presbyterian Church
In memory of McKevers Bayard Brown (Single Ward Room)
Caroline B. Sellew (4 Beds)
The Red Cross Rooms for Nurses (3 Single Ward Rooms)
Robert W. deForest (Single Ward Room)
Henry W. deForest (Single Ward Room)
James R. Steers
Jane Livingston Armour, in memory of John A. Livingston
Jane Livingston Armour, in memory of Herman O. Armour
In memory of Meredith Howland Pyne
Stella C. and Roi C. Megrue (Single Ward Room)
Mrs. E. C. Wills, in memory of her mother, Mrs. J. F. Ackerman, and her sister, Mrs. W. Clarence Reed
- 1929 Caroline White, in memory of her sister, Eliza W. White
Elizabeth A. Hays, in memory of William and Charlotta Hays
- 1930 Mr. and Mrs. Ernest Trow Carter
The Presbyterian Church in the Town of Rye, New York
Mrs. Arthur E. Lauderback, in memory of her mother and father, Esther Hull Jackson and Peter A. H. Jackson
Mary L. Walker Peters, to be known as "The Charles Grenville Peters and Mary Walker Peters Free Bed"

- Marie F. Coddington, to be known as
"The Emilie Coddington Bed"
- 1931 Mrs. Clara Beales Obrig, in memory of
Adolph Obrig and Clara Beales Obrig
(Single Ward Room)
Alfred V. Meserole, in memory of his mother,
Evelina A. Meserole
- 1932 In loving memory of Justine Adele Stafford
(Mrs. W. F. Stafford) by her sister,
Ida Evelina Bliss
- 1933 Mrs. John A. Hance and Mrs. Irene Louise Hance,
in memory of James R. Jesup
- 1934 Ida Adams, in memory of her sister, Sadie E. and
her brother, Robert F. Adams (Single Ward
Room)
Josephine Leypoldt, in memory of her brothers,
Louis and Frederick Leypoldt (2 Beds)
- 1935 Walter J. M. Donovan, in memory of his father,
Timothy Donovan
- 1936 Elizabeth P. Hewes, to be known as
"The Elizabeth P. Hewes Bed"
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
Mary S. Thayer, to be known as
"The Orlando Thayer Bed"
- 1937 Margaretta J. Gamble, to be known as
"The Gamble Bed," in memory of her
father and mother
Jeremiah Milbank, in memory of his father,
Joseph Milbank
- 1938 Susetta L. Goss, to be known as "The Goss Bed,"
in memory of her parents, Rev. C. C. Goss and
Theodosia C. Goss
Annie Miller, to be known as "The Mrs. Alexander
Miller Memorial Bed," in memory of her
mother, Mrs. Alexander Miller
Bertha H. Minturn, in memory of her most
faithful and beloved nurse, Mary Humphries
Henry T. Sloane, to be known as "The Euphemia
Sloane Coffin Bed," in memory of his sister,
Euphemia Sloane Coffin
- 1939 "In Memoriam"
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- 1940 George Gibbs, to be known as "The George
Gibbs Bed"
- 1942 Mrs. Huntington McLane, to be known as the
"Therese K. Thorne Bed," in memory of her
mother
Cornelia Livingston Pell, in memory of
Alfred Duane Pell
Frank Wallach, in memory of Ida May Wallach
- 1943 Stuart Duncan, to be known as
"The Stuart Duncan Bed"
- 1944 Anonymous, to be known as "The Dr. William
Darrach Bed"
John Fraser, in memory of his parents,
Alexander and Elizabeth Fraser
- 1945 Robert W. Carle, in memory of his mother,
to be known as the "Cornelia Willets Carle Bed"
for general hospital use including harelip and
cleft palate cases
- 1947 W. and J. Sloane
Frederick Sturges, Jr., Mrs. Mary Armit Sturges,
Mrs. Catharine Armit Chapman and Frederick
Sturges, III, in memory of Frederick Sturges
Walter S. Gifford, in memory of his son,
Walter Sherman Gifford, Jr.
Ida L. Darling, to be known as the
"Richards Memorial Bed"
John Sloane, in memory of his wife, Elsie Nicoll
Sloane, to be known as the "Elsie Nicoll
Sloane Bed"
Elisa Smith Mabon, in memory of her husband,
James Brown Mabon
- 1948 Otto M. Eidlitz, to be known as the "Eidlitz Bed"
- 1949 Effie B. Sheaman
- 1951 Gerrish Hill Milliken
- 1952 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
- 1953 Estate of Charlotte C. Garretson, to be known as
the "Charlotte Higbee Kelsey Bed"
W. Alton Jones Foundation, Inc., to be known as
the "Nettie Marie Jones Bed"
- 1954 Estate of M. Samuel Stern, to be known as the
"M. Samuel Stern Memorial"
- 1955 Estate of Robert J. Eidlitz, to be known as the
"Marc Eidlitz Bed"
Mrs. John S. Holbrook, in memory of her parents,
John Johnston and Mary Sloane Sinclair
- 1956 Estate of Aurie Dell Black, to be known as the
"Aurie Dell Black Bed"
Robert W. Carle, to be known as the
"Adele Skiddy Carle Bed"
Estate of Adolph Riesenbergs, to be known as
"The Adolph and Anna A. Riesenbergs Bed"
- 1957 George F. Cahill, M.D., to be known as the
"Endowed Bed for Personnel of the Squier
Urological Clinic"
Edward H. Carle, in memory of his father, to be
known as the "John J. Carle Bed"
Mrs. William J. Demorest, in memory of her
parents, Wealthy H. Lewis and
Richard James Lewis
Chancellor Kent Lodge 870, Free and Accepted
Masons, in memory of George J. Weissman
Morris Morgenstern Foundation, to be known as
the "Sadie B. Morgenstern Bed"
Estate of Mary Ross Potter, to be known as the
"Georgianna Morley Bed"
Estate of Mathilde S. Sterne, to be known as the
"Simon Sterne Beds" (4 Beds)
Board of Trustees of The Presbyterian Hospital,
in honor of and to be known as the "Charles P.
Cooper Endowed Bed"
- 1958 Mrs. Robert W. Carle, to be known as the
"Robert W. Carle Bed"
- 1959 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
Mrs. Stanley G. Mortimer, to be known as the
"Stanley G. Mortimer Bed," in memory of her
husband
Mrs. John S. Thacher, to be known as the "Frances
E. Baker Bed," in memory of her mother

- 1960 Estate of Exerene L. Flood, to be known as the
"Dr. George Ballery Flood Endowed Bed"
Minister, Elders and Deacons of The Collegiate
Reformed Protestant Dutch Church of The City
of New York, to be known as "The May A.
Ingenthron Memorial Bed"
Estate of James Miller, to be known as the
"A. Miller Endowed Bed"
Estate of Joan D. Sanger, to be known as the
"Bertram J. Sanger Endowed Beds" (2 Beds)
- 1961 Estate of Ellen Clarke Bertrand, to be known as
the "Ellen Clarke Bertrand Memorial Endowed
Bed"
Mr. and Mrs. Samuel W. Meek, in memory of
Michael Jeremy Meek
- 1962 Mrs. William J. Demorest, to be known as the
"Howard W. Albro Memorial Endowed Bed"
Estate of Henrietta S. Wolf, to be known as the
"Julia Wolf Endowed Bed"
- 1963 George S. Walden, in loving memory of
Mrs. Julia E. Carroll
- 1965 Estate of Mildred E. Sterry, in memory of her
mother, Katherine Landers; her brother John J.
Landers and herself (4 Beds)
- 1966 Estate of Agnes Irvine, in the name and memory
of Daniel Elmer Salmon (6 Beds)
Estate of Florence R. Paul, in memory of her
mother, Kathryn Wilson Roberge (5 Beds)
Estate of Florence R. Paul, in memory of her
brother, Franklin Pierce Roberge
- 1967 Estate of Clarence J. Schmelzel, to be known as
the James Henry Schmelzel and Annie Louise
Schmelzel Endowed Beds. (12 Beds)
- 1968 Estate of Catherine Ridley, in memory of her
mother, Catherine Ridley, and her father,
Arthur J. Ridley (5 Beds)
- 1969 Estate of Catherine Ridley, in memory of her
mother, Catherine Ridley, and her father,
Arthur J. Ridley (7 Beds)
- 1970 Estate of John W. Hornor, to be known as the
John W. Hornor Endowed Beds (2 beds)
- 1970 Estate of Florence R. Paul, in memory of her
mother, Kathryn Wilson Roberge (4 beds)

Memorial Endowed Beds for Research Purposes

- 1948 Mrs. William Barclay Parsons, in memory of her
husband, General William Barclay Parsons
Muriel Jane Rudinger Foundation, Inc., to be
known as the "Muriel Jane Rudinger Bed"
- 1950 Charles E. Culpeper Foundation, Inc. (2 Beds)
- 1952 John F. Bush Memorial Bed
Estate of Selma Boyd, each to be known as a
"Boyd Bed" (2 Beds)
Bruce Barton, in memory of his wife, to be known
as the "Esther Randall Barton Memorial Bed"
- 1953 Herman Goldman Foundation, Inc., in memory of
Theresa and Frank Goldman

- W. Alton Jones Foundation, Inc., in memory of
Mamie W. Marvin
- 1954 Mr. and Mrs. Charles P. Cooper, in memory of
Mrs. Cooper's father, Dr. Charles Lathrop
Parsons
"John Shepard Parke Memorial Bed"
Mr. and Mrs. Sidney J. Weinberg, in memory of
their parents
- 1955 Bruce Barton, in memory of Clyde Scott and Helen
Barton Stilwell, to be known as the "Clyde Scott
and Helen Barton Stilwell Memorial Bed"
George F. Cahill, M.D., Research Bed in the
Department of Urology
Mr. and Mrs. Charles P. Cooper, in memory of
Mrs. Cooper's mother, Mrs. Charles Lathrop
Parsons
Herman Goldman Foundation, Inc., in memory of
Theresa and Frank Goldman
Williams-Adler Foundation Bed
- 1959 "John Shepard Parke Memorial Bed"

Endowed Rooms

- 1903 Henry H. Rogers, to be known as "Room J"
- 1905 Mrs. Morris K. Jesup, to be known as the
"Eliza de Witt Memorial Room"
- 1910 Mrs. John Stewart Kennedy, in memory of her
husband, to be known as the "J. S. K. Memorial
Room"
- 1912 Peter Cumming, to be known as "The Peter
Cumming Memorial Room"
- 1926 Alumnae Association of the School of Nursing of
The Presbyterian Hospital, to be known as the
"Amabel S. Roberts Memorial Room"
- 1928 Mrs. William Sloane, to be known as "The William
Sloane Room for Graduate Nurses"
- 1930 The Sarah A. Hard Taylor Memorial Fund, to be
known as "The Sarah A. Hard Taylor Room"
- 1935 Mrs. Herbert Neal, in memory of her first husband,
James Norman Hill
- 1937 S. Augusta Mora, in memory of her husband,
Frank Mora and mother, Sarah Robson
Van de Water
- 1946 Estate of Caroline Catherine Cary, to be known
as the "Caroline Catherine Cary Endowed
Room"
- 1960 Mr. and Mrs. Robert W. Carle, to be known as
"The Robert W. and Adele S. Carle Endowed
Room"
Estate of Bertha C. Miller, to be known as the
"James Miller Endowed Room"
- 1961 Estate of Sarah Louise Johnston, to be known as
the "Andrew Johnston Memorial Room"
- 1962 The Dr. Thomas W. Stevenson Memorial Fund, a
semi-private room to be known as "The Dr.
Thomas W. Stevenson Memorial Endowed
Room"
- 1963 Estate of Adele S. Carle, to be known as the
"Robert W. Carle Rooms" (7 Rooms)

- 1964 Mr. John S. Thacher, in memory of his mother,
Frances Lake Thacher
- 1965 Estate of Jennie Hankinson Sinclair, two rooms to
be known as "The Francis MacDonald Sinclair
Endowed Room," and "The Jennie Hankinson
Sinclair Endowed Room"
- 1970 Estate of Constance G. Gross in memory of
Constance G. and Gustave Gross

Babies Hospital

- 1892 The Cribside Committee, to be known as
"Cradyl-Nyst"
- 1894 Miss Ellen James Evans
Henry Stewart Trevor, by Mrs. Henry G. Trevor
- 1895 Mrs. Evan T. Walker
Mrs. Richard Arnold, in memory of
Georgiana Arnold
- 1896 Mr. and Mrs. Charles M. Fry, to be known as the
"Mr. and Mrs. Charles M. Fry Bed"
- 1897 Mrs. George Kemp, for the use and purposes of
the Hospital
- 1898 Mrs. Oliver G. Jennings, to be known as the
"Brewster Bed"
- 1899 Mr. and Mrs. John Sherman Hoyt, in memory of
John Sherman Hoyt, Jr.
- 1900 Mrs. Elizabeth Chamberlin Lockwood, in memory
of Emily Beaver Chamberlin
- 1902 Mr. and Mrs. William E. Dodge, in memory of
their granddaughter, Grace Osborn
Henry P. Wertheim, in memory of
Clara W. Wertheim
- 1904 Mr. and Mrs. George Arents, in memory of
George Arents Brown
Estate of Mrs. Charles Harvey Hartman
- 1905 Mrs. J. Henry Lane
Mrs. Daniel S. Lamont, to be known as the
"Julia Lamont Bed"
- 1907 The Cribside Committee
- 1908 Arthur W. Butler, in memory of
Elizabeth Marshall Butler
- 1910 Dr. and Mrs. L. Emmett Holt, in memory of
Kenneth M. Holt
Edwin Clarence Moller, in memory of his father,
Peter Moller
- 1911 Emily A. Watson, in memory of Wheeler Watson
Mrs. Bradley Martin, in memory of
David Bradley Martin
- 1912 In loving memory of J. Bradley Cumings, endowed
by his friends. "Greater love hath no man than
this, that a man lay down his life for his friends."
— *St. John 15:13*
- 1914 Mrs. Andrew Carnegie, in memory of
Archibald Fraser Barrow
Estate of Mrs. Robert W. Todd, to be known as
"The Mabel Todd Bed"
- 1916 Mr. and Mrs. John Chandler Moore, in memory
of Edward de Bébian Moore, the
"Edward de Bébian Moore Bed"
- Mrs. John Hubbard, in memory of
Margaret Fahnestock
- Mrs. Clarence M. Hyde, to be known as the
"Clara Mathewson Hyde Bed"
- 1917 Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
- Mrs. Edward S. Harkness, to be known as the
"Thomas Stillman Taylor Bed"
- Mr. and Mrs. Walter A. Hirsch, in memory of
John Walter Hirsch
- 1919 Mr. and Mrs. Daniel Schnakenberg, in memory of
their daughter, Anna Kate Bartlett
- Mrs. John Jay Knox, in memory of John Jay Knox
Mrs. John Jay Knox, in memory of
Dr. Reuel B. Kimball
- 1920 Mrs. Andrew Carnegie, a thanks offering for
Louise Carnegie Miller
- 1921 Estate of Jacob H. Schiff
- 1922 The Cribside Committee, in memory of
Sarah Elizabeth Williams
Mr. and Mrs. Simon Guggenheim, in memory of
their son, John S. Guggenheim
- 1923 Mr. and Mrs. Herman Armour Nichols, in loving
memory of Marie Louise Nichols
- 1929 Estate of Julia M. Stout
- 1930 Estate of Edith Crosby Thomson, in memory of
her mother, Mrs. Grace H. Thompson
- 1934 West End Collegiate Church
- 1935 Estate of Daniel Schnakenberg, in memory of his
children, Daniel Schnakenberg, Jr. and
Marie Schnakenberg
- 1936 Estate of Carrie Guggenheim
- 1938 Estate of Emily S. Hornblower, in memory of her
stepdaughter, Susie Sanford Hornblower, the
"Susie Sanford Hornblower Bed"
- 1949 Dr. Frederic H. Bartlett. Endowed in loving mem-
ory of Frederic H. Bartlett, M.D., 1872-1948, by
his patients and other friends, to commemorate
his many years of faithful service in Babies
Hospital
- 1950 Estate of Emelyn L. Coolidge, in memory of
Marianna Wheeler and Emelyn L. Coolidge,
M.D., to be known as "The Wheeler-Coolidge
Bed"
- Estate of Isabel Shields Kemp, to be known as the
"Mary M. Shields and the Dr. Robert Coleman
Kemp Free Bed"
- 1957 Estate of Martha S. Reynolds, in memory of her
mother, Ernestine Schaffner
- 1962 Estate of Caroline D. Hewitt, to be known as the
"Caroline Danella Hewitt Endowed Bed"
- 1964 Mr. and Mrs. Samuel Rogovin, in honor of their
parents, Mr. and Mrs. Louis Rogovin and
Mr. and Mrs. Bernard R. Simon

Neurological Institute

- 1929 The Red Cross Endowed Room for Nurses
Rivington-Dwyer Endowed Room for Nurses
- 1943 Alice Dunning Starr, in memory of her husband,
Allen Starr
- 1959 Jack J. Dreyfus, Jr., in honor of his father, the
"Jack J. Dreyfus, Sr. Bed"
- 1967 "In Memory of Mrs. Sidney J. Weinberg, donated
by her husband and Family."
"In Memory of Helen Livingston Weinberg (Mrs.
Sidney J. Weinberg) from funds donated by her
friends and those of the Family."

Memorial Endowed Beds for Research Purposes

- 1952 Estate of John H. Bahrenburg, in memory of
John H. Bahrenburg and Elizabeth Bahrenburg
(16 Beds)

New York Orthopaedic Hospital

- 1883 Miss C. B. Hicks, continued in perpetuity by
Buchanan Winthrop
- 1886 Mrs. Elizabeth Milbank Anderson, in memory of
J. Milbank Anderson (4 Beds)
- 1891 Alfred Corning Clark (3 Beds)
Edward Severin Clark, to be known as the
"Edward Severin Clark Beds" (2 Beds)
Mrs. Henry S. Winthrop
- 1893 Mrs. William D. Sloane, in memory of
William Douglas Sloane, Jr.
James K. Gracie, in memory of
Anna Bulloch Gracie
Miss Sarah B. Gibbs
- 1894 Mrs. Richard Tylden Auchmuty, in memory of
Richard Tylden Auchmuty (2 Beds)
James H. Jones
- 1896 Mrs. William Astor, in memory of
Helen Roosevelt
Mrs. Evan T. Walker, in memory of
John J. Walker
- 1897 Mrs. William D. Sloane, one bed in memory of
Maria Louise Vanderbilt and one in memory of
Emilie Vanderbilt Burden
- 1898 Mrs. Charles B. Alexander, for her daughter,
named the "Harriet Alexander Bed"
- 1901 Mrs. N. A. Baldwin, in memory of
Louise Suydam Duer
Mrs. Benjamin Brewster, in memory of
Benjamin Brewster
Jessie and Emily Sloane Bed, endowed by their
father, Henry T. Sloane
Mrs. Marion Story, in memory of
M. Furman Hunt
- 1902 James Henry Smith, in memory of
George Smith (2 Beds)
Miss Emily A. Watson, in memory of
Mrs. Mary J. Walker

- 1904 Miss Cornelia Prime, in memory of her brother,
Temple L. Prime
Miss Helen Phipps
James K. Gracie, in memory of
Esther Gracie Ogden
- 1906 Miss Caroline White
Mrs. M. Dwight Collier, in memory of
Maurice Dwight Collier
- 1908 Mrs. H. N. Munn, Mrs. Augusta Munn Tilney and
Orson D. Munn, in memory of
Henry Norcross Munn
- 1911 Estate of Everetta C. Whitney
Miss Josephine C. Smith, in memory of her father,
Dr. Edward A. Smith, and her mother,
Rebecca Miller Smith
- 1913 Estate of Marion de Forest Clark, in memory of
Julian Bouton Clark
An anonymous donor, to be known as the
"Mary Townsend Cuyler Bed"
Caroline F. Butterfield, in memory of
Frederick Falconer Butterfield
- 1915 Miss Emily Trevor
Mrs. Frederick W. Vanderbilt, to be known as
"The Louise Bed"
George Grant Mason, in memory of his uncle,
James Henry Smith (2 Beds)
- 1916 Henry M. Tilford, in memory of
Catharine Hunt Tilford
Estate of Clementine Furniss, to be known
as the "Clementine Furniss Bed"
An anonymous donor
- 1917 Mrs. Charles H. Senff, in memory of her little son,
Henry Senff
Mrs. A. Murray Young, in memory of her
great uncle, Wilson G. Hunt
- 1919 R. Fulton Cutting, to be known as the
"Helen Suydam Cutting Bed"
Mrs. Frederick Delano Hitch
Levi P. Morton, in memory of
Anna Livingston Morton
Miss Georgiana G. R. Wendel, in memory of her
sister, Augusta A. S. Wendel (2 Beds)
Various donors, in memory of
Theodore Roosevelt
- 1920 Mrs. John Hobart Warren
- 1921 Mrs. Winthrop W. Aldrich, in memory of her
little son, Winthrop Williams Aldrich, Jr.
F. Ambrose Clark, to be known as
"The Florence L. Clark Bed"
- 1922 Mrs. David T. Dana, in memory of her mother,
Mrs. M. Dwight Collier
- 1924 Estate of Charlotte Bruce Bickmore, in memory
of Albert Smith Bickmore, Jr.
Estate of Louise Ward McAllister Lewis,
in memory of her mother, Sarah T. McAllister,
to be known as "The Sarah T. McAllister Bed"
- 1925 Estate of Elizabeth J. Hofer, in memory of
Horatio C. Kretschmar (2 Beds)
Percy Chubb, in memory of his wife

- Junior Red Cross of the Public Schools of
the City of New York
Mrs. Douglas Robinson, in memory of her friend,
Charles Allen Munn
- 1926 Junior Red Cross of the Public Schools of
the City of New York
- 1927 Darrach Home for Crippled Children, in memory
of Dr. May Darrach
- 1928 Mrs. Mary L. Schoonmaker, in memory of
Sylvanus Lothrop Schoonmaker and
Frank Layng Schoonmaker (10 Beds)
Estate of Henry D. Dickinson, in memory of
Hathaway M. Dickinson
- 1930 James T. and Sarah Bancroft Leavitt, to be known
as the "Mrs. James T. Leavitt Bed"
- 1934 Henry C. deRham, Frederic F. deRham and
Clarisse deRham Rutherford, in memory of
their parents, Charles and Emily Howe deRham
- 1935 Mrs. Percy R. Pyne and family, in memory of
Meredith Howland Pyne
- 1936 Miss Elizabeth Stewart Hamilton, in memory of
Mrs. John Hobart Warren, to be known as
the "Harriette Mott Warren Bed"
Mrs. Edward S. Harkness, to be known as the
"Dorcas House Bed" in dear memory of
Wilma Gideon
- 1938 Miss Grace Howard Potter, to be known as the
"Howard and Mary Louisa Potter Bed,"
in memory of her father and mother
- 1955 General and Mrs. E. F. Maude, in memory of
Mrs. Maude's father, Robert S. Brewster
Estate of Carrie Rosenshine, to be known as
"The Lillie Rosenshine-Marjorie L. Kaufman
Bed"
- 1956 Estate of Adolph Riesenbergs, to be known as
"The Adolph and Anna A. Riesenbergs Bed"
- 1967 Estate of Elliot W. Lawrance, in memory of
Clifford Lawrence King.
- 1967 Estate of Elliot W. Lawrance, in memory of
Mrs. Thelma Mary Lawrance.

Endowed Rooms

- 1922 Glenn Ford McKinney, a ward room in the
country branch, in memory of his wife,
Jean Webster McKinney
- 1929 400 of his friends and associates, a room in the
private pavilion, in memory of H. Le Roy von
Lackum, M.D., surgeon in this hospital,
1916-1928
- 1967 Mrs. Anna I. Feldman, a semi-private room, in
memory of her husband, to be known as the
Anna I. Feldman Room, in loving memory of
her husband, Irving J. Feldman.

Edward S. Harkness Eye Institute

(Including Herman Knapp Memorial Eye Hospital)

- 1883 Mrs. Oswald Ottendorfer
- 1884 Miss Henrietta A. Lenox
- 1895 Miss Mary Morris van den Heuval
- 1897 Mrs. Giovanni Ceccarini
- 1913 Miss Catherine A. Bliss
Miss D. Willis James
- 1918 Truman Peck Stone
- 1921 Miss Rosie Bernheimer, in memory of her parents
- 1923 Miss Mary Wiley, in memory of her brother,
George Wiley
- 1928 Mrs. Matilda Townsend Palmer
- 1931 Lee Doblin
- 1936 Charles M. Brooks
- 1957 The Mortimer and Harriet M. Marcus Foundation,
Inc., to be known as "The Mortimer and
Harriet M. Marcus Endowed Bed"
- 1964 Estate of Thomas W. Byrnes, in memory of his
wife, Minnie Marcey Jarboe Byrnes
- 1973 The Mortimer and Harriet M. Marcus Founda-
tion, Inc., to be known as "The Mortimer and
Harriet M. Marcus Endowed Bed"

Endowed Bed for Research Purposes

- 1965 Malcolm P. Aldrich, to be known as the
"Malcolm P. Aldrich Endowed Research Bed"

Index to Professional and Academic Staffs

PAGE	PAGE	PAGE
Abadir, Nelly F. ....258	Amols, William .....282	Bachman, Lillian .....302
Abadir, Sami A. ....258	An, Teisa .....264	Bachner, Paul .....285
Abbate, Vincent J. ....301	Ancas, Araceli R. ....287	Baden, Ernest .....285
Abbott, Richard E. ....288	Anastasiades, Anastasios .....287	Badgley, Robin F. ....293
Abdullah, Syed .....289	Anderson, Albert A. ....271	Baehr, George .....293
Abell, Liese L. ....277, 279	Anderson, Albert D. ....267, 294	Baer, Jeanne W. ....294
Abelson, David C. ....302	Anderson, Ethel .....284	Baer, Leslie P. ....260, 279
Abelson, Jacob .....259, 302	Anderson, Thomas L. ....265	Bakamjian, Veronica .....277
Abrahams, Irving .....259, 278	Andorsky, Michael B. ....265	Baker, Alice T. ....260
Abrams, Cyril A. L. ....264, 287	Andreae, Eric .....281	Baker, Jr., Daniel C. ....246, 247, 263, 270, 271, 284
Abramson, David .....263	Andree, Ronald A. ....277	Baker, David H. ....266, 270, 293
Abreu, Luis M. ....296	Andresen, Richard A. ....283	Baker, John D. ....260
Abt, Renee J. ....265	Andrews, David L. ....263, 270, 284	Baker, Katherine J. ....279
Abu Nassar, Solange G. ....286	Andrews, George C. ....258	Baker, Vernon G. ....280
Acre, Anthony A. ....290	Ans, Roy P. ....262	Balinson, Norman V. ....291
Adamec, Kenneth .....293	Ansaneli, Jr., Vincent W. ....267, 295	Balis, Eugene A. ....261
Adams, David J. ....262	Anstendig, Howard S. ....301	Balkoura, Athanasia .....266, 289
Adams, George H. ....293	Antar, Robert .....265	Ballantyne, Lowyd W.R. ....295
Adams, J. Barclay .....261	Antinori, Charles H. ....268	Ballard, Andre B. ....265, 289
Adams, Jr., John F. ....263	Antunes, Joao L. ....261	Ballard, Bruce L. ....290
Adams, Mary .....265	Appel, Gerald B. ....260	Ballard, Harold S. ....280
Adelson, Jerry J. ....301	Appel, Madeline N. ....287	Balser, Benjamin H. ....265, 290
Adlersberg, Mella .....277	Applebaum, Edmund .....276, 301	Bandy, Lajos .....283
Adsit, Charles G. ....281	Appleby, Robert E. ....264, 286	Bank, Arthur .....259, 278
Agasso, Edwardo J. ....287	Applewhite, Harold L. 273, 274, 300	Bannerman, Alfred C. ....262, 282
Agate, Frederic J. ....276	April, Ernest W. ....272, 276	Banogon, Petra E. P. ....286
Ain, Brent R. ....268	Aranow, Jr., Henry ....259, 268, 278	Banyard, Richard D. ....263, 284
Akhter, Jeanette E. ....262	Arkoulakis, Stamatis E. ....295	Barach, Alvan L. ....258
Albert, Harry .....266, 289	Armstrong, Edward B. ....301	Baral, William C. ....302
Alberti, Luis N. ....290	Armstrong, Jeanne .....294	Barbanel, Charles J. ....290
Aldin, Peter .....289	Armstrong, Robert B. ....268	Barbee, William R. ....259, 278
Alexander, George .....277, 288	Aronoff, Michael S. ....266, 289	Barden, Herbert .....285
Alexander, H. Clay .....296	Asch, Thane .....267, 293	Bargren, John H. ....263
Alexander, Jack T. ....288	Aseme, Kate N. ....268	Barker, Doris .....282
Alexander, Raymond S. ....292	Ash, Rosemary L. ....282	Barker, Harold G. ....247, 267, 295
Alexander, Stewart F. ....260, 279	Ashford, Thomas P. ....270, 295	Barker, Leslie P. ....258
Allard, Gilles .....285	Ashley, Charles A. ....270, 286	Barkhuus, Arne C. V. ....291
Allen, Gail B. ....291	Ashley, Esther R. ....290	Barlow, Barbara A. ....268
Allen, John D. ....288	Askenasy, Alexander R. ....289	Barns, Douglas H. ....283
Allen, Lucretia .....285	Asnes, Russell S. ....264, 268, 270, 286	Barnum, Howard J. ....260, 279
Allendorf, Dennis .....265, 287	Atchley, Dana W. ....246, 258, 276	Baron, Michael .....301
Alling, Frederic A. ....289	Atchley, John A. ....266, 289	Barone, Mary R. ....282
Almenoff, Irwin A. ....285	Athos, William P. ....281	Barrett, C. Redington ....260, 281
Alpert, Elmer .....280	Atkin, M. David .....287	Barrett, Robert E. ....262, 281
Alpert, Meyer .....293	Attia, Albert .....280	Barrette, Gregoire .....262
Alston, Casco .....260, 279	Atwal, Jasit B. ....258	Bartalos, Mehaly .....278
Alsup, Peggy Ann .....282	Atwood, Kimball C. ....270, 278	Bartsch, Ernst G. ....283
Altman, Harry S. ....264	Atwood, William G. ....259, 278	Bartwink, Jerome .....259, 302
Altman, Ina A. ....294	Auchincloss, Jr., Hugh ....267, 295	Basek, Milos .....263, 270, 284
Altman, Philip .....264	August, Burton .....266, 289	Bass, Stephen C. ....268
Altmann, Kenneth A. ....280	Austin, Esther B. ....270	Bassett, C. Andrew L. ....263, 284
Altschuler, Kenneth Z. ....265, 288	Austin, III, Howard A. ....268	Bassiur, Martin .....302
Amarant, Martha L. ....265, 287	Austin, John .....267, 293	Batt, Ellen R. ....282
Amberson, J. Burns .....258, 276	Avella, Arthur N. ....265, 290	Battista, Joseph V. ....262
Ambinder, Robert L. ....300	Awan, Tayyiba .....261	Bauer, Philip J. ....300
Ambrose, George B. ....263, 284	Axelrod, Judith .....280	Baum, Gerald .....280, 293
Ames, Martin I. ....302	Ayers, Herbert D. ....273, 302	Baum, Ricurda L. ....287
Ames, Richard P. ....260, 280	Azzoni, Alfred A. ....267, 295	Bauman, Eli .....260, 279
Ames, Rose G. ....264, 287	Bachman, Arnold L. ....293	Bauman, William A. ....264, 286
Amin, Hussein K. ....262, 283	Bachman, Donald M. ....267	Baurmash, Harold D. ....301
Ammann, Margot .....283		

PAGE	PAGE	PAGE
Baxt, William G. ....261	Bernstein, Robert S. ....280, 297	Bonner, Jr., Mack .....280
Beaty, John T. ....260, 279	Berry, Frank B. ....276	Bordiuk, Joseph M. ....264, 286
Beaulieu, Patricia A. ....282	Bertles, John F. ....260, 280	Borek, Carmine .....293
Beck, Gustav J. ....260	Bertrand, Charles A. ....280	Borzky, Paul N. ....292
Beck, Leah .....265, 289	Bertsch, Robert G. ....267, 268, 295	Bosch, Ernesto .....262
Becker, Alfred .....260, 279	Besen, Gerald H. ....300	Boschenstein, Frank K. ....262, 282
Becker, Jr., George L. ....281	Beube, Frank E. ....301	Bosken, Carol H. ....260, 279
Becker, Natalie .....292	Bhargava, Madhu M. ....283	Bossart, Peter A. ....296
Beckmann, Albert J. ....265, 291	Bhattacharyya, Arun .....267	Botros, Samir B. ....258
Bedic, Olivera .....267	Bhonslay, Shivaji B. ....267, 295	Bowe, Edward T. ....262, 270, 283
Beeckler, Donald C. ....267	Biavati, Bruce J. ....293	Bowen, Florry P. ....282
Beekman, Robert S. ....281	Bickerman, Hylan A. ....260, 279	Bowers, William B. ....263
Been, Valerie C. ....302	Bickers, David R. ....259, 278	Bowie, Richard R. ....262
Beg, Khalid .....279	Bigger, Jr., John T. ....259, 278, 288	Boxer, Robert A. ....265
Begg, Charles F. ....286	Bilchick, Edwin B. ....263	Bowman, Jr., Frederick O. ....267, 270, 295
Behrens, Myles .....263, 284	Bilezikian, John B. ....260	Boyajian, Levon Z. ....265, 289
Behrman, Richard E. ....264, 270, 271, 272, 286	Bilezikian, Sophie B. ....261, 279	Boyd, Alvin T. ....300
Belgraiier, Arnold H. ....268	Binkert, A. J. ....246, 247, 255, 270, 271, 272, 293	Bozidar, Lazarevio .....286
Belinson, Jerome L. ....262	Bird, Hector R. ....291	Bradford, Mary E. ....265
Bell, A. Loomis .....280	Birkoff, John .....268	Bradley, Geraldine P. ....260, 279
Bell, Donald C. ....266, 289	Bissell, LeClaire .....280	Bradley, Stanley E. ....259, 278
Bell, Edward F. ....265	Bito, Laszlo Z. ....284	Bradlow, Paul A. ....289
Bell Frank C. ....263	Blabey, Jr., Robert G. ....267	Bragg, Everett C. ....263, 284
Bell, Jennifer J. ....264, 272, 286	Black, Dorothy A. ....258, 277	Braham, Stanley B. ....267, 296
Bell, Robinette N. ....266, 289	Black, Thomas J. ....267	Branche, George C. ....260, 280
Bell, William B. ....287	Blackwood, Carlton E. ....283	Branche, Matthew D. ....295
Beller, Alexander .....289	Blagman, Patricia .....282	Brand, Leonard .....258, 268, 277
Bellin, Lowell E. ....291	Blair, Charles E. ....261	Brandt, Philip W. ....270, 276
Belmont, Lillian M. ....291	Blair, Charles R. ....296	Branwood, A. Whitley ....264, 285
Beltrani, Vincent S. ....259	Blair, Robert L. ....301	Braren, Margery M. ....292
Bemporad, Jules R. ....265, 289	Blake, Melvin .....285	Brasel, Jo Anne ....264, 286, 297
Bender, Adam .....262	Blanc, William A. ....264, 285	Braun, Carl W. ....262, 280
Bender, Estelle P. ....289	Blancato, Louis S. ....277	Braun, Norma Mai Tsen Wang ....260, 280
Bender, Sidney E. ....282	Bland, James W. ....258	Bray, Bonnie A. ....279
Benedicto, Erlinda .....301	Blank, Martin .....270	Brazin, Stewart .....267
Benedicto, Godofredo V. ....301	Blank, Harold H. ....302	Breakstone, Robert S. ....307
Benedito, Milagros .....262, 297	Blank, Martin .....288	Bredice, Marjorie A. ....287
Bendixen, Henrik H. ....246, 258, 270, 271, 276	Blank, Robert D. ....301	Breed, R. Huntington .....261
Benesch, Reinhold .....277	Blazina, V. John .....262, 282	Breeland, Nona I. ....301
Benesch, Ruth E. ....277	Blechman, Abraham M. ....301	Bregman, David .....267
Benfield, James W. ....300	Blechman, Martin G. ....292	Brennan, Barbara A. ....28
Bennett, Courtenay L. ....290	Blitz, Alma T. ....265, 287	Brennan, F. James .....267
Bennett, Ruth .....289	Blomain, Eric W. ....268	Brennan, Jr., John T. ....291
Bennett, Sidney J. ....295	Blood, David K. ....260	Brenner, Richard W. ....29
Bennett, Stephen L. ....266, 289	Bloom, Daniel H. ....300	Brensilver, Jeffrey M. ....261
Bennett-Clark, Suzanne ....292, 297	Bloom, Robert S. ....292	Bridger, Abraham A. ....287
Benninghoff, Edith B. ....285	Bloom, Stanley M. ....268, 296	Bridges, Jr., Thomas J. ....261, 28
Benoit, Edith B. ....282	Bloomfield, Martin E. ....279	Briggs, John P. ....266, 28
Benovitz, Harvey .....280	Blum, Jr., Alexander ....264, 286	Brill, Henry .....29
Berc, Kenneth M. ....291	Blum, June .....289	Brill, Paula W. ....29
Berdon, Walter E. ....266, 293	Blum, Richard H. ....262	Brin, Myron .....291, 29
Berenberg, Richard A. ....262	Blume, Ralph S. ....260, 279	Brisbane, Samuel C. ....27
Berger, Agnes P. ....291	Blumenfeld, Thomas A. ....264, 285, 286	Briscoe, Anne M. ....28
Berger, Milton .....289, 290	Blumenstock, David A. ....295	Brisman, Ronald .....261, 28
Bergmann, Lawrence W. ....301	Blumenthal, Marvin R. ....288	Britten, John S. ....260, 28
Berman, Beth E. ....282	Blumenthal, Richard L. ....289	Brod, Morton S. ....30
Bernal, Victor .....290	Bodian, Carol A. ....292	Broderick, Cecil B. ....28
Bernard, Stephen A. ....261	Boelstler, Roy .....300	Brodey, Marvin .....25
Bernard, Viola W. ....258, 290	Bogdasarian, Michael .....268	Brodzka, Wanda .....29
Bernick, Raymond .....266, 289	Bohles, Hans J. ....265	Broell, John R. ....29
Bernot, Robert .....280	Bolt, Richard A. ....268	Bronson, Winifred .....26
Bernstein, Anne E. ....266, 289	Bond, Victor P. ....293	Brooks, Mary .....28

PAGE		PAGE		PAGE	
Brower, Julian A.	287	Byrne, John C.	268, 296	Cassebaum, William H.	296
Brown, Arthur S.	262	Bysshe, Stanley M.	262	Cassidy, Thomas M.	289
Brown, Jr., Charles B.	263			Castadot, Marie-Jeanne	264
Brown, David H.	263	Cabot, Anthony	268	Catalano, Louis	262
Brown, Donald E.	285	Cabot, Catherine F.	261	Cattell, James P.	265, 288
Brown, Earl B.	280	Cadden, James L.	291	Caulfield, John P.	264
Brown, Harold W.	276	Caemmerer, Jr., Alex	291	Cavallaro, William U.	263, 284
Brown, Howard J.	293	Caffey, John	258, 276	Cave, Herbert G.	270, 277
Brown, James A.	260, 279	Cahn, Lester R.	259, 276, 286	Cedarbaum, Alvin D.	302
Brown, Jason W.	262, 282	Cain, Jr., Edward A.	259, 273, 274, 300	Cederquist, John W.	265, 289
Brown, Jay	260, 280			Ceen, Richard F.	301
Brown, Margaret F.	293	Caldwell, Arline C.	291	Chabon, Irwin	283
Brown, Nancy C.	283	Caldwell, Peter R. B.	259, 278	Chabora, Alice J.	301
Brown, Roland P.	292	Califano, Paul F.	266, 289	Chaitman, Edmund	290
Brown, Roy H.	294	Callahan, Mary E.	294	Challenor, Bernard D.	270, 271, 291
Brown, William R.	287	Calvin, Harold I.	278	Challenor, Yasoma B.	267, 294
Brownlee, William H.	291	Camasura, Octavio	258	Challop, Roger	265, 287
Bruce, Gordon M.	258, 276, 284	Cameron, Airlee A. C.	281	Chandler, Boris C.	295
Bruck, Harold M.	267, 295	Camesas, Pandelis	300	Chang, Chu Huai.	246, 266, 270, 293
Bruenn, Howard G.	258	Camins, Martin	261	Chang, Hai Won	282
Brunn, Jr., Frederick M.	263	Campbell, Charles J.	262, 284	Chao, Solan	246, 262, 283
Brunner, Hans R.	261, 279	Campbell, Milton F.	263, 284	Chargaff, Erwin	270, 271, 273, 277
Brunngraber, Elinor F.	277	Campbell, Patrick	261	Chariff, Sonia	289
Bruno, Leonard A.	268	Campbell, Robert J.	289	Charles, Nancy K.	282
Bruno, Sebastian A.	259, 302	Campbell, William L.	267, 293	Charney, Jonathan	262
Brunswick, Ann F.	291	Camunas, Jorge L.	268	Chasalow, Fred	283
Brush, John M.	264	Cancro, James J.	302	Chattah, Leon	266, 289
Brust, Jr., John C. M.	262, 282	Canfield, Robert E.	259, 272, 278	Chauhan, Prem	286
Brust, Matilda B.	265, 286	Cannaliato, Joseph A.	287	Chavis, Pamela	262
Bruun, Bertel	282	Cannarozzi, Nicholas A.	260, 279	Chazan, Solomon	265, 287
Bryan, R. Nick	267	Cannon, Joe H.	287	Chen, John	284
Bryant, John H.	270, 271, 291	Cannon, Paul J.	259, 278	Chen, Kwan-Hwa	297
Brzustowicz, Stanislaw H.	259, 273, 300	Cantor, Herman	302	Chen, Yee Chong	267
		Cantor, Murray A.	300	Cherico, Daniel J.	302
Buchanan, John L.	260, 279	Capaccio, Beverly A.	282	Cherkasky, Martin	293
Buchanan, Steven	266	Capriccio, John F.	302	Chernack, William	265
Buchbinder, Elinor	282	Carberry, David M.	296	Chernoff, Arthur	260
Buckner, John H.	263	Carbonara, Peter N.	263, 284	Chertoff, Harvey R.	266
Buda, Joseph A.	267, 295	Carden, Jr., George A.	259	Chiarandini, Irene	266, 291
Budd, Daniel C.	268	Cardenas, Leopoldo	262	Chien, James T. T.	280
Budin, Joel A.	267	Cardinale, S. Gerald	300	Chien, Shu	288
Budinger, John M.	285	Cardona, Hernando	284	Chilton, Neal W.	291, 302
Budner, Stanley	291	Carey, Jr., Edward J.	295	Chiou, Ming Chuan	277
Budowsky, Jack	259, 302	Carey, William B.	262	Cho, Dong Wook	267, 294
Buerkle, A. Roy	263	Caritas, Steve N.	262, 283	Cho, Jung-Ho	267
Buhler, Fritz R.	261	Carlson, Robert H.	261	Chodoff, Mark E.	268
Buimovici-Klein, Elena	287	Carlson, Susan B.	265	Choe, Woomyung	267
Bull, Marcia B.	260, 280	Carluccio, Jr., Charles	266, 290	Chojnacki, Michael	266
Bull, Sherman M.	267, 295	Carmel, Peter W.	261, 268, 281, 297	Chong, Claude Yuk-Yeung	267
Bund, Emanuel	291	Carmical, Neville W.	263, 285	Chou Tsui-Chin	288
Bunting, Robert W.	261	Carnay, Laurence	262	Choy, Daniel S. J.	260, 279
Bunyaviroch, Sunthorn	283	Caronia, Victor S.	259, 273, 302	Choy, Octavio G.	267
Buonanno, Aurelio	289	Carpenter, Malcolm B.	262, 276	Christakis, George J.	293
Burger, Loren C.	267	Carr, Arthur C.	270, 288	Christenfield, Roger M.	289
Burnett, Bernard C.	260, 279	Carrillo, Rafael O.	268	Christy, Nicholas P.	259, 271, 280
Burris, John O.	260, 279	Carrion, Arturo L.	278	Chrzanowski, Paul J.	260
Bush, David C.	263	Carroll, Frank D.	262, 284	Chu, Luke S. W.	293
Bush, Freda C.	283	Carroll, Robert E.	263, 284	Chusid, Joseph G.	261, 281
Bush, Jr., Harry L.	268	Carter, Elizabeth W.	282	Chutorian, Abe M.	261, 281
Bush, Michael A.	260	Carter, Rodman D.	295, 296	Chynn, Kuo-York	294
Butler, Christine M.	282	Carter, Sidney	261, 281	Cimino, Joseph A.	293
Butler, Jr., Vincent P.	259, 270, 278	Casarella, William J.	267, 293	Cinberg, James Z.	263
Button, Kenneth	264	Casazza, Albert R.	280	Cinque, Salvatore G.	295
Butts, Hugh F.	271, 289	Case, Robert B.	260, 280	Cisar, John Ormond	281

	PAGE		PAGE		PAGE
Cizek, Louis I.	288	Coward, Joe E.	270, 281	Davidson, Hugh C.	281
Clark, Noreen M.	292	Cowen, David.	258, 285	Davis, Elizabeth B.	265, 290
Clark, W. Crawford.	288	Coyle, Michael P.	263	Davis, Hillard.	292
Clark, William S.	280	Cozine, Kathryn A. W.	258, 277	Davis, John S.	279
Cleary, Constance P.	282	Craig, Edward V.	261	Davis, Samuel.	292
Cleveland, Mather.	258	Cramer, Fritz J.	258	Davis, William J.	247, 263, 286
Co, Cayetano C.	267, 294	Crandell, DeWitt.	265, 289, 292	Davol, Peter B.	266
Cobin, Harold P.	302	Cranefield, Paul F.	288	Day, Robert McC.	262, 270, 284
Cocchiarella, Antonio.	267, 294	Crawford, David B.	283	Dayan, Jean.	277
Coelho, Jaime B.	279	Crawford, Mary I.		Deakins, Susan M.	280
Coen, Stanley J.	266, 289		246, 255, 270, 271, 272, 282	Dean, John van B.	260, 279
Cohen, Daniel E.	266	Creque, Luritz C.	286	Dean, Jurrien.	261
Cohen, Gerald.	277, 288	Crikelair, George F.	247, 267, 295	DeAngelis, Catherine.	264, 286, 292
Cohen, Herbert I.	287	Crittenden, Jacob Y.	268	deBary, William T.	270, 273
Cohen, Max P.	289	Croll, Barney M.	302	DeBellis, Robert H.	260, 279
Cohen, Michael H.	260, 279	Cromie, John B.	280	deCatalogne, Gerard.	283
Cohen, Patricia R.	292	Cropper, Jean B.	293	deChabon, Ada B.	285
Cohen, Philip.	261	Crow, John F.	266	Deesen, Kenneth C.	300
Cohen, Sidney M.	262, 282	Crowley, Robert E.	302	Defendini, Richard F.	262, 270, 285
Cohen, Solomon J.	264, 286	Crumrine, Patricia.	262	DeFries, Zira.	265, 289
Coigny, Rodolphe L.	292	Crupi, Claudio.	263, 285	DeHaan, Clayton R.	296
Colcher, Henry.	260, 279	Cuatico, William.	297	Deitch, Arline D.	285
Cole, Raymond M.	263, 285	Cuckler, Ashton C.	291	deJesus, Antonita.	258
Cole, Robert M.	301	Culleton, James F.	262, 282	DeJulia, Joseph A.	259, 302
Coleman, D. Jackson.	263, 284	Cunnick, William R.	280	DeLeon, Francisco S.	258
Coleman, Louise.	289	Cunningham, Allan S.	287	De Lisi, Joseph C.	302
Colenda, Mary Ann.	265	Cunningham, James K.	260, 279	Dell, Ralph B.	264, 286
Collard, Jean E.	279	Curnen, Jr., Edward C.	264, 286	Demarest, Robert J.	276
Collette, Patricia J.	292	Curnen, Mary G.	292	Demartini, Felix E.	
Collins, Janna C.	265	Curth, Helen O.	259		246, 247, 259, 270, 278
Colman, Neville.	285	Curth, William.	259	Demby, Neal Alan.	300
Colombotos, John L.	272, 291	Curtis, Walter W.	292	Dempsey, Edward W.	
Colp, Jr., Ralph.	291	Cushman, Paul.	260, 280		270, 271, 273, 274, 276
Colvett, Robert D.	293	Cuttita, Joseph A.		deNapoli, Robert A.	261, 282
Coman, Alexander.	283		259, 273, 274, 302	Denckla, Martha B.	262, 282
Conklin, E. Foster.	295	Cyrus, Earland.	293	Denning, Carolyn R.	
Conley, Glenna J.	285				246, 264, 271, 286
Conley, John J.	263, 285	Dadac, Pamela J.	282	Denny, John E.	290
Conroy, Richard C.	291	D'Adamo, Ann P.	260	Denton, John R.	263
Cook, Diana C.	290	Daglian, Kourken A.	259, 301	Derby, Bernice R.	282
Cook, John A.	265, 289	Dailey, Thomas H.	296	Dermksian, George.	281
Cooper, Arnold.	265, 288	Daines, Joseph G.	268	deRoeth, Jr., Andrew.	262, 284
Cooper, Henry S. F.	267	Daley, John M.	260, 279	Derosena, Roger.	264
Cooper, Louis Z.	264, 287	Dalgin, Paul.	261	Derosis, Helen A.	291
Cooper, Michael D.	293	Dallas, Donald P.	281	DeSalvo, Ernest J.	280
Cooper, William C.	262, 284	Dallolio, Stephen J.	258	DeSanctis, Peter N.	268, 296
Copenhaver, Wilfred M.	276	D'Alton, Clarence J.	260, 279	DeScipio, Frank J.	293
Corbin, Eustace E. S.	295	Dalton, Dennis.	266, 289	D'Esopo, D. Anthony.	246, 258, 276
Corbitt, Theodore.	295	Dammann, Gloria L. A.	293	Despommier, Dickinson D.	292
Corpus Marina A.	287	Damrosch, Douglas S.	264, 286	Deutsch, Adelaide A.	294
Correll, James W.	261, 270, 281	Daniel, Salha S.	277	Dev, Vaithilingham G.	278
Cosgriff, Stuart W.	259, 278	Daniels, George E.	258	Devi, Sarala A.	262, 282
Cosla, Horace W.	294	Darakjian, Raymond Z.	301	Devlin, Raymond.	290
Cosman, Bard.	267, 295	Darby, Michele.	300	DeVoe, Arthur Gerard.	
Coss, Jr., James A.	260, 279	D'Arc, Victor.	291		246, 262, 270, 271, 283
Costa, John L.	265, 287	Darling, Robert C.	246, 258, 276	Dhaliwal, Atvar S.	268
Costa, Marjorie A.	292	Darrell, Richard W.	263, 284	Diamond, Betty A.	261
Cote, Lucien J.	261, 281	Darwin, Harold.	302	Diamond, Leonard.	289
Cotter, Lawrence H.	260	Das Hasi.	283	Diamond, Michael.	280
Cotton, John.	291	David, David S.	281	Diasio, Karen F. B.	294
Countee, Roger W.	261	David, John.	291	Dick, Frederick S.	268, 296
Cournand, Andre F.	258, 276, 279	Davidoff, S. Robert.	302	Dick, Harold M.	263, 284
Cournos, Francine.	266	Davidson, Charles W.	270, 271	Dickinson, Ruth.	294
Cowan, Richard.	266	Davidson, Henry A.	290	Dickinson, Seldin J.	295

	PAGE
Diener, Harry	289
Dietrick, William R.	268
Dietzgen, Walter A.	266
DiGrande, Elaine V.	259, 278
DiJohn, John C.	280
Dillenberg, Stanley M.	261
Dilley, William G.	276
Dillon, Donald	288
Dillon, Thomas F.	283
Dilworth, Agnes D.	279
Di Mango, Anthony L.	259, 301
Dinin, Benjamin G.	293
DiPasquale, Ned	263
Di Re, John J.	286
DiSalvo, Nicholas A.	259, 273, 274, 301
Dische, Zacharias	276, 277, 284
Diserens, Deborah F.	300
Dixon, Rosina B.	280
Dobbs, Leland G.	260
Dobson, Chalncey H.	263, 284
Doerr, Iris L.	281
Doft, Martin D.	291
Dohrenwend, Barbara S.	290
Dohrenwend, Bruce P.	288
Dolganos, Ellen M.	266, 290
Domonkos, Anthony N.	259, 278
Donaldson, Kenneth T.	280
Donham, Robert T.	258, 277
Donn, Anthony	262, 271, 284
Donnelly, Brian	267
Donnenfeld, Hyman	286
Donovan, Carmel N.	294
Donovan, John V.	302
Donovan, J. Timothy	268, 296
Donovan, Ruth U.	265, 287
Donovan, William R.	292
Donson, Nathaniel	291
Dougherty, Jocelyn	262
Dougherty, Louis J.	268, 296
Downey, John A.	267, 270, 271, 294
Downs, Elinor F.	264, 270, 291, 297
Dragon, Leon H.	260
Dransfield, Douglas A.	265
Dresdale, Robert J.	260
Dresdale, Susan S.	265
Drew, Gerald M.	300
Driscoll, John M.	264, 270, 286
Driscoll, Yvonne T.	264, 286
Drusin, Ronald	260, 279
Druss, Richard G.	265, 289
Drysdale, Wayne A.	302
Duane, Jr., Richard B.	260, 279
Ducey, James	280
Duffy, Philip	264, 270, 285
Duggan, William P.	262
Dunn, Albert A.	294
Dunn, Jr., Clarence A.	296
Dunn, Robert N.	263
Dunner, David L.	265, 289
Dunnington, John H.	246, 258, 276
Dunton, Harlow D.	265, 286, 288
Durrer, Gustav T.	302
Duvoisin, Roger C.	261, 281

	PAGE
Dvorak, Robert F.	293
Dworkin, Samuel F.	274, 300, 302
Dwyer, Edward M.	272, 280
Dwyer, John F.	283
Dy, Ernesto Y.	268
Dyrenfurth, Inge	283
Dyro, Frances M.	262
Eakins, Kenneth E.	284, 288
Earle, Ann	270
Earle, Anna M.	282
Eaton, Richard G.	296
Ebaugh, Duane W.	265, 287
Eberle, Robert C.	263, 285
Eckhaus, Morris	302
Eckman, Judith	289
Edie, Richard N.	267, 295
Edmonds, Craig	263
Edmunds, Robert T.	296
Edreira, Juan G.	279
Edsall, John R.	280
Edwards, Pauline	290
Eftekhar, Nas E.	263, 284
Egan, James	266, 291
Eggers, Howard	263
Egri, Gladys	290
Ehmann, Virginia E.	282
Eidsvold, Gary M.	293
Einbinder, Julia M.	278
Eisenberg, Jeanne A.	292
Eisenberg, Max A.	277
Eisenstein, T. Donald	265, 287
Eisert, Jack	259, 278
Elftman, Herbert O.	276
Elinson, Jack	291
Elliott, Jr., Robert H. E.	255, 258
Ellis, Kent	267, 270, 293
Ellison, G. Alden	291
Ellner, Paul D.	261, 270, 281
Ellsworth, Robert M.	262, 284
Ely, Charles A.	276
Emann, Robert E.	292
Emmers, Raymond	288
Emy, Robert K.	280
Enderle, Erna S.	260
Endicott, Jean	289
Endicott, Noble A.	290
Engelhardt, Dean L.	281
Enson, Yale	260, 280
Epstein, Ralph A.	258, 277
Epstein, Stefan E.	285
Erganian, Jane A.	265, 287
Erhardt, Carl L.	291
Erickson, Dorothy A.	260, 279
Erlanger, Bernard F.	270, 281
Erlanger, Steven M.	263
Erlenmeyer-Kimling, Loise	288
Eryol, Azak S.	286
Esecover, Harold B.	266, 289
Esman, Aaron H.	291
Esposito, Jr., John	301
Espy, John W.	262, 284
Esser, Aristide H.	266, 290
Esser, Peter D.	293

	PAGE
Esser, Robert A.	262, 282
Essig, Judith	300
Estes, Dorothy	260, 279
Estrin, Elizabeth G.	265, 287
Etess, A. David	266
Etra, Bernard	265, 287
Evans, Hugh E.	287
Evans, Nelson F.	293
Ewing, Margaret L.	287
Fadil, Richard	296
Fagan, Ora S.	292
Fahn, Stanley	261, 281
Fairchild, Beatrice M.	280
Falk, Arlene	287
Falk, Eugene P.	263
Farhangi, Mehdi	260, 279, 297
Farrell, Thomas A.	295
Farrer, Sanford M.	286
Farris, R. Linsy	263, 284
Fasy, Thomas	264
Faverio, Charles D.	260, 279
Fay, Thomas H.	285
Feder, Samuel L.	290
Feigelson, Eugene B.	291
Feigelson, Muriel	283
Feigelson, Philip	277, 297
Feinberg, Gerald L.	258, 277
Feind, Carl R.	267, 295
Feinerman, Arthur E.	261
Feinfeld, Linda	266
Feinsmith, Burton M.	264, 286
Feinstein, Robert P.	259, 278
Feirstein, Ira D.	266
Feldman, Bernard R.	264, 286
Feldman, Frieda	267, 293
Feldman, Matthew	265, 287
Feldman, Richard S.	289
Felix, Marie D.	276
Feltman, James A.	281
Felton, Charles P.	280
Felton, Hiroko	283
Fenner, Jeanne E.	287
Fenoglio, Cecilia M.	264, 286
Fenoglio, John J.	264, 285
Fenton, Arnold N.	283
Fenton, Richard L.	263, 284
Ferin, Michel	283, 288, 297
Fernandes, Manuel	296
Ferrara, Joseph	287
Ferrebee, Joseph W.	279
Ferrer, Jr., Jose M.	267, 270, 271, 272, 295
Ferrer, M. Irené	259, 278
Fertig, John W.	266, 291, 297
Fiber, Frederick	263
Fidler, Gail S.	294
Fielding, Joseph W.	284
Fields, James P.	278
Fields, Martin J.	259, 302
Fierer, Joshua	264, 285
Fieve, Ronald R.	265, 288
Filner, Bernard E.	258, 277
Finby, Nathaniel	294

	PAGE		PAGE		PAGE
Finck, Arthur D.	258	Freda, Vincent J.	262, 283	Gause, Robert W.	263
Findlay, Jr., Charles W.	267, 295	Frederickson, Keville	282	Gaut, Zane H.	281
Fine, Daniel H.	302	Freehafer, John G.	287	Gavras, Haralambos	261, 279
Fine, Stanley R.	280	Freeman, Harold P.	295	Gavras, Irene	261, 279
Fingerhut, Bruno	296	Freeman, John R.	263	Gayle-Thompson, Dolores J.	287
Fink, Arnold I.	301	Freeman, Stanley P.	302	Gaylin, Willard	288
Finkel, Jerry B.	266, 290	Fremont, Henry N.	292	Gearing, Frances R.	291
Finkel, Stuart F.	261	Fretz, Alfred F.	296	Geer, Francis G.	281
Finkelstein, Ludmila S.	267, 294	Frick, II, Henry Clay	262, 283	Geiger, Arnold M.	302
Finn, James E.	261	Friedberg, Eugene	266, 289	Gelman, Anna K.	292
Finster, Mieczyslaw	258, 270, 277	Friedman, Joel	302	George, Edward	261
Firdman, Marvin F.	300	Friedman, Arnold P.	282	Gerbi, Claudio	260
Firestein, Stephen	289	Friedman, Paul A.	261	German, Harold	261
Fischbarg, Jorge	284, 288	Friedman, Richard C.	266, 290	Gershberg, Myron R.	265, 289
Fischel, Edward E.	259, 279	Fries, Brant E.	292	Gersony, Welton M.	264, 286
Fischer, Anita	289	Friis, Robert H.	292	Gerst, Paul H.	267, 295
Fischman, Harlow K.	278	Fritz, Herbert P.	300	Gerstein, Herbert	267, 293
Fish, George W.	246, 258, 276	Fruchtbaum, Harold	292	Gersten, Joanne C.	292
Fishberg, Max P.	302	Furey, Clement A.	268, 296	Ghaemmagham, Mohsen	279
Fisher, Lloyd C.	260, 279	Furman, Sylvan S.	293	Ghanta, Vijaya M.	285
Fisher, Morton A.	291	Furth, Jacob	276, 286	Giardina, Elsa-Grace	260, 279
Fisher, Pearl R.	293	Futch, Charlton	268	Gibbon, John	288
Fisher, Robert L.	301			Gibbs, Barbara C.	290
Fisk, Shirley C.	259, 279	Gabriel, James B.	280	Gibbs, Stanley L.	301
Fitzig, Charmaine M.	282	Gabriele, P. Charles	302	Gibson, R. Suzanne	290
Fitzpatrick, Hugh F.	296	Gaerlan, Pureza F. M.	264, 286	Gidro-Frank, Lothar	265, 288
Flack, J. Vincent	262	Gaetz, Harold P.	286	Gilbert, Louis J.	266, 289
Flapan, Mark	289	Gaines, John E.	262	Gilbert, Jr., Stanley H.	287
Fleigel, Jeffrey D.	263	Galassi, Mario S.	258	Gilder, Rodman	265, 289
Fleischman, Roy	261	Galen, Robert S.	264, 285	Gill, Elizabeth S.	276
Fleiss, Joseph L.	291	Gallinek, Alfred	261	Gillette, Nedra P.	294
Floch, Howard F.	268	Galloway, Shelby	267, 293	Gilman, Sid	261, 270, 281
Flood, Charles A.	258, 276	Gallozzi, Ennio	277	Gilmour, Edward E.	291
Fodor, Peter B.	268	Galton, Harry A.	301	Ginsberg, Allen	291
Fogel, Gerald I.	290	Galvin, Gerald M.	302	Ginsberg, Harold S.	270, 271, 272, 273, 274, 281
Foley, Archie R.	265, 288, 291	Gambino, S. Raymond	264, 271, 285	Ginsburg, Iona H.	290
Follett, David A.	267, 293	Gambito, Erlinda S.	258	Ginsburg, Sara	282
Forbes, Max	262, 284	Gamboia, Eugenia	262, 281, 282	Giuliani, Edoardo	295
Ford, Edna K.	293	Gangat, Yakub M.	258	Givan, Jr., Thurman B.	264, 286
Ford, Joseph	296	Gapper, Karin E. Freas	282	Gladstein, Mark O.	263
Forde, Kenneth A.	267, 271, 295	Garber, C. Zent	264, 286	Gladstone, Leonore Z.	267
Forester, Bruce	266, 290	Garcia, Alexander	263, 268, 272, 284	Glaser, Stephen	264, 286
Forrest, Arnold W.	263, 284	Garcia, Helen-Ann	260, 279	Glass, Blanche	291
Forrest, David V.	289	Garcia, Leonardo	262	Glass, Leonard	287
Forstell, Wallace R.	290	Garcia, Rodriguez Julio M.	277	Glassman, Alexander H.	265, 289
Forstenzer, Stephen L.	293	Gardner, Jared J.	264	Glaven, Richard J.	290
Forster, Eugene	266, 289	Gardner, Lee R.	266, 289	Glen, Dulaney	281
Foster, Goodwin L.	276	Gardner, Richard A.	265, 289	Glick, Alvin J.	266, 289
Foster, Pearl D.	280	Gardner, Robert A.	268	Glick, George L.	302
Fox, Jr., Charles L.	281, 295	Gardner, William A.	295	Glick, Robert A.	266, 290
Fox, Lavina G. M.	265	Garfein, Oscar B.	280	Gliedman, Monroe M.	301
Foy, Carol J.	282	Garitano, William W.	266	Gliedman, Richard	301
Frame, John D.	292	Garnes, Arthur L.	295	Glusman, Murray	265, 288
Franciscus, Marie	294	Garnes, Harold A.	296	Gochfeld, Michael	292
Franck, Walter	280	Garret, Rudolf	286	Godman, Gabriel	264, 281, 285
Francois, Egel	295	Garrett, Alice L.	263, 284	Goetz, Jack	302
Frank, Judith E.	264, 287	Garrett, Thomas	261	Golbey, Maurice	266, 290
Frank, Kenneth	289	Garvey, Glenda J.	261	Gold, Aaron A.	284
Frank, Marjorie H.	290, 292	Gaston, Peter F.	290	Gold, Allen M.	277
Frankel, Olga	265, 289	Gaston, Sawnie R.	263, 284	Gold, Arnold P.	261, 281
Franklin, David N.	264, 286	Gates, Marguerite J.	264, 286	Gold, Richard P.	267
Frantz, Andrew G.	259, 271, 278	Gattegno, Edgar	300	Gold, Steven I.	302
Fraser, Owen D.	268	Gavis, Gustave	264, 286	Goldart, Jed	266
Fraser, Robert W.	296				

PAGE	PAGE	PAGE
Goldart, Natalie .....293	Graves, Oscar N. ....277	Hall, Robert E. ....262, 283
Goldberg, Doris K. E. ....264, 286	Gray, Carolyn F. ....300	Haller, Jack .....267
Goldberg, Ivan K. ....266, 289	Grayson, Alvin J. ....259, 302	Haller, Raphael M. ....285
Goldberg, Max .....290	Grebin, Burton .....264, 286	Halleran, Leo B. ....280
Goldberg, Morrell .....293	Green, Albert .....301	Hallock, Halford .....263
Goldberger Mark J. ....261	Green, Donald H. ....263	Halpert, Wesley .....301
Golden, Ross .....258, 276	Green, William M. ....267, 294	Halvorsen, Gladys C. ....290
Goldensohn, Eli S. ....261, 270, 281	Greenbaum, Lowell M. ....272, 287	Halmagyi, Denis F. ....287, 295
Goldfarb, William .....265, 290	Greenberg, Carolyn P. ....258, 277	Hamilton, Jr., Lloyd A. ....266, 289
Goldin, Gurston .....266, 289	Greenberg, Henry M. ....280	Hamilton, William G. ....263, 284
Goldin, Joel .....302	Greenberg, Richard A. ....300	Hamlin, Linda K. ....282
Goldin, Victor .....265, 289	Greene, Andrew .....263	Hamlin, Robert H. ....291
Goldman, George .....290	Greene, Edward L. ....289	Hammer, Muriel .....288
Goldman, Jack J. ....292	Greene, Justin L. ....291	Hammer, Scott M. ....261
Goldman, Robert S. ....302	Greenfield, Edward .....300	Hammerling, Alden .....292
Goldsmith, Jay P. ....301	Greenspan, Kenneth .....266, 289	Hammill, James F. ....261, 281
Goldsmith, Seth B. ....292	Greenwood, Albert .....264	Hanania, Anevar .....283
Goldstein, Eda G. ....290	Greer, Douglas F. ....263	Hanauer, Lonnie B. ....260, 279
Goldstein, Inge F. ....292	Grey, Ross M. ....285	Handlers, Martin .....300
Goldstein, Irwin .....260, 279	Grieco, Michael H. ....260, 280	Handzer, Barnardo .....283
Goldstein, Marc .....268	Griffin, William .....293	Hangorsky, Charlotte .....300
Goldstone, Jonas M. ....260, 281	Griffiths, Sylvia P. ....264, 286	Hanks, Edgar C. ....258, 277
Goldwater, Eugene .....266	Grinnell, Robert S. ....267	Hannon, Virginia R. ....293
Goldwater, Leonard J. ....276, 293	Griswold, William R. ....265	Hansen, Holger H. ....292
Gollance, Harvey .....293	Grokoest, Albert W. ....259, 279	Hanson, Ronald L. ....277
Gollub, Edith G. ....277	Gross, Gary D. ....302	Harber, Leonard C. 264, 247, 259, 270, 271, 278
Gomez, Erwin P. ....268	Gross, Howard .....266	Harding, Errol N. ....277
Goodbody, Maurice F. ....281	Gross, Paul .....258	Harfenist, Elizabeth J. ....279
Goode, Louise A. ....274	Gross, Wendy A. ....280	Harisiadis, Leonidas .....267
Goodfriend, Susan .....292	Grossbard, Lionel .....260, 279	Haroldson, Jr., Olaf .....263, 285
Goodman, DeWitt S. ....259, 278, 297	Grossman, Bertram H. ....264, 286	Harovas, Antoine C. ....280
Goodman, Edmund N. ....267, 295	Gruber, Michael L. ....262	Harper, David G. ....263
Goodman, Fredric E. ....300	Gruenberg, Ernest M. ....265, 288, 291	Harris, David .....293
Goodman, Irving .....277, 295	Grunberger, Dezider .....277, 297	Harris, Herman S. ....302
Goodman, Jerome D. ....265, 289	Grundfest, Harry .....276, 282	Harris, Paul D. ....296
Goodman, Leon J. ....293	Guarin, Urbano K. ....296	Harris, Ruth C. ....264, 286, 297
Goodman, Reba .....285	Guichert, Iwan D. ....292	Harrold, Jr., Charles C. ....296
Goodman, Sol L. ....265, 289	Guinee, Vincent F. ....292	Hart, Edward J. ....262, 282
Goodman, Stephen F. ....302	Gump, Frank E. ....267, 271, 295	Harter, Donald H. ....261, 281
Goodstein, Carolyn E. ....280	Gunning, Lucille C. ....287, 294	Harvey, Rejane .....259, 278
Goran, Michael J. ....266	Gunther, Stephen J. ....261	Hartwell, Patricia W. ....258
Gordon, Allan D. ....291	Gurewitsch, A. David .....258	Hashim, Sami A. ....291, 297
Gordon, Howard .....302	Gurian, Bernard .....302	Hasselbacher, Peter .....261
Gordon, I. Bruce .....264, 286	Gurian, Harvey .....290	Hassman, Gary C. ....263
Gordon, James .....266	Gurland, Barry .....288	Hatfield, Wendell B. 260, 270, 271, 279
Gordon, Susan G. ....264, 286	Gusberg, Richard J. ....268	Hatterer, Myra S. ....290
Gorham, Peter .....290	Gutenstein, Beulah .....293	Hauptert, Garner T. ....261
Gorman, John G. ....264, 285	Gutstein, Walter A. ....268, 300	Hawa, Charles S. ....262
Gorman, Sheila A. ....292	Guttmann, Ruth J. ....293	Hawkins, Katherine A. ....261
Gorosh, Martin E. ....297	Guy, Matthew J. ....261	Hawn, Clinton Van Z. ....286
Gorsel, Erol O. ....296	Haagensen, Cushman D. ....258, 276	Hayes, Constance J. ....264, 286
Goss, Thomas P. ....263	Haas, Joanna .....261	Hays, Arthur P. ....264
Gottsegen, Irving .....293	Haas, Robert L. ....301	Heacock, Don R. ....289
Gottsegen, Robert 259, 273, 274, 301	Haberman, Paul W. ....291	Head, William B. ....266
Graf, Liselotte .....285	Habert, James H. ....280	Healey, Jr., William V. ....296
Graham, Fiona .....266, 289	Habif, David V. ....267, 295	Healton, Edward B. ....262
Granato, Robert .....296	Hager, Wesley P. ....261	Hecox, Bernadette .....295
Granato, Roberto C. ....268	Hagstrom, Jack W. C. ....264, 270, 286	Heddle, Stewart B. ....268
Grandin, Dean J. ....262, 283	Hahn, Fred I. ....289	Hefler, Stephen .....265
Grant, Edward V. ....293	Hakusa, Norma .....290	Hehlmann, Rudiger .....261
Grant, Jr., John P. ....268, 296	Halderman, Jack C. ....293	Heidelberger, Michael .....276
Grant, Ronald A. ....266	Hall, Bernard H. ....290	Heilbrunn, Ernst .....258, 277
Grantham, S. Ashby .....263, 284	Hall, Eric J. ....293	

	PAGE		PAGE		PAGE
Heimarck, Gregory	290	Hofmann, Frederick	270, 271, 287	Isgreen, William P.	262, 282
Heimbach, Sidney B.	266	Hogan, James A.	260, 279	Israel, Jacob S.	258
Heimlich, Donald L.	295	Hogan, Judith R.	295	Iverson, David	266, 290
Heintze, Achim	262	Holgerson, Leif O.	296	Iwamoto, Takeo	284
Heird, William	264, 286	Hollyfield, Joe G.	284		
Heissenbuttel, Robert H.	260, 279	Holstein, Stanley	262, 282	Jackman, Norman	268
Helbig, Donald W.	292, 297	Holt, Peter R.	260, 272, 280	Jackier, Kenneth	302
Heller, Charles	267	Holtzman, Robert	261	Jackson, Bettie S.	282
Heller, Joseph	260	Holub, Donald A.	259, 279	Jacob, Elizabeth	286
Heller, Stanley S.	266, 289	Holzman, Alfred	302	Jacob, Ginette B.	260, 279
Hellerman, Don V.	285	Hoover, A. Walter	291	Jacobs, Jerry C.	264, 272, 286
Helming, Charles V.	263	Hopewell, William S.	281	Jacobs, Martin H.	287
Hembree, Wylie	260, 279, 283	Hopf, Frank R.	300	Jacobs, Thomas P.	261
Henderson, Ann S.	278	Horan, Anthony	268	Jacobson, Ivan V.	283
Hendin, Herbert	289	Hordof, Allan	265, 287	Jacobson, Linbania	282, 297
Henley, Jean	277	Horiguchi, Terusada	283	Jacobson, Robert L.	300
Henneman, Philip H.	280	Horn, James B.	301	Jacovelli, Joseph	277
Hennig, George C.	260, 279	Horowitz, Ira A.	267, 293	Jacox, Harold W.	258, 276
Henretig, Robert D.	294	Horowitz, Sidney L.	259, 273, 274, 301	Jaffe, David	265, 289
Henrikson, Ray C.	276			Jaffe, Jerome H.	265, 288
Henry, Douglas C.	265	Hosannah, Hilton O.	300	Jaffe, John	268
Henry, George K.	295	Hosiosky, Ellen N.	302	Jaffe, Joseph	288
Herbert, Jr., Charles M.	293	Housepian, Edgar M.	261, 281	Jaffee, Conrade	267
Herbert, Victor	285	Howanitz, Joan	264	Jagiello, Georgianna	262, 270, 272, 278, 283, 296
Herlands, Robert E.	302	Howard, Clifton M.	266, 289	Jakobiec, Frederick A.	264
Herman, Jr., Emory C.	279	Howard, George M.	263, 284	James L. Stanley	264, 276, 286
Hermann, William H.	293	Howell, J. Taylor	264	James, William A.	263, 284
Herrero, Fernando	262	Howland, Peter A.	291	Jameson, A. Gregory	272, 280
Herson, Joseph H.	289	Hoynak, Rose M.	282	Jan, Kung-Ming	288
Herter, Frederic P.	246, 267, 271, 295	Hsu, John T.	294	Janecka, Ivo	263, 285
Herz, Marvin I.	265, 288	Hsu, Konrad C.	281	Jansky, Jeannette J.	287
Herz, Jr., Ralph J.	260, 279	Hsu, Shih-piao	258	Jaretzki, III, Alfred	267, 295
Herz, Reinhard G.	261	Hu, Ian	259, 301	Jarvik, Lissy F.	288
Herzlinger, Robert A.	265, 287	Huckaba, Charles A.	294	Jasne, Stanley Jay	283
Hess, Alfred	294	Huettner, Robert J.	301	Jeffrey, John C.	292
Heyendal, Richard N.	258	Hugg, Terry W.	266	Jenkins, Alva	293
Hiatt, Robert B.	267, 295	Hughes, James E. O.	281	Jenkins, John Preston	280
Hicks, Patricia M.	265	Hui, Robert M.	263, 268, 284	Jensen, Philip B.	268, 296
High, E. Jeffrey	293	Humphreys, II, George H.	246, 258, 276	Jervis, George A.	265, 290
Hilal, Sadek	267, 293			Jewelewicz, Raphael	262, 283, 297
Hilton, James G.	280	Hunt, Howard F.	288	Jewett, Frank	289
Hindels, George W.	302	Hunt, Winslow R.	265, 289	Johngren, Peter M.	290
Hinds, Archibald K.	277	Hur, Young	258	Johnson, Christopher A.	294
Hines, Henry L.	259, 278	Hurvitz, Arthur L.	285	Johnson, Frank R.	268
Hirsch, Donald R.	262	Husain, Musa K.	261	Johnson, James J.	300
Hirsch, Robert L.	285	Hutchings, Donald E.	288	Johnson, Lewis A.	264, 285
Hirschfeld, Leonard S.	301	Hutchinson, John E.	267, 295	Johnson, Lyme	261
Ho, Mary M.	282	Hyman, Allen I.	246, 258, 271, 277, 286	Johnson, Paul K.	260, 279
Hoar, Richard M.	276			Johnson, Philip M.	267, 293
Hoberman, Morton	267, 294	Hyman, George A.	259, 279	Johnson, Jr., Raymond F.	302
Hochberg, Richard	283	Hyman, Sonia W.	266	Johnston, Austin D.	264, 284, 285
Hoche, John P.	261			Jones, Althea M.	270, 294
Hocherlin, Diane	287	Iacuzzo, John C.	268	Jones, Barbara	297
Hochman, Sidney A.	259	Iaquanta, Frank E.	280, 291	Jones, Ira Snow	262, 284
Hochroth, Fadel M.	287	Ifarraguerri, Carlos	266, 290	Jones, Julia M.	278
Hochstetter, Werner	265	Iglehart, Vivian R.	287	Jones, Robert W.	292
Hodas, Morton M.	266, 289	Imbriglia, Joseph E.	263	Jones, S. Lee	270
Hoefler, Paul F. A.	258, 276	Indyk, Leonard	286	Jones, Thomas W.	293
Hoefle, Frank B.	263, 284	Infantolino, Philip T.	280	Jordan, Herman C.	284
Hofeldt, Albert J.	263	Ingraham, Hollis S.	291	Jordan, Kenneth G.	262
Hoffman, Brian F.	246, 265, 270, 271, 273, 287	Inselman, Laura	265	Josen, Autar S.	295
Hoffman, Joel S.	266, 290	Ioachim, Harry L.	285	Joseph, Peter M.	294
		Ionescu, Gheorghe D.	268	Josephson, Eric	291
		Isaacson, Robert	301		

PAGE	PAGE	PAGE
Ju, David M. C. ....267, 295	Kaufman, Howard H. ....261	Klatskin, Bertram .....259, 301
Jubelt, Burk .....262	Kaufman, Mavis .....285, 288	Klavins, Janis V. ....286
Juhlin, Einar A. ....259, 278	Kaufmann, Carole A. ....282	Klein, Henriette R. ....290
Junemann, Henry R. ....301	Kavaler, Florence .....293	Klein, Nora J. ....265
Jung, Hyun J. ....264	Kavey, Neil B. ....266, 290	Klempert, Milton .....302
Justice, Michael W. ....268, 296	Kawai, Masataka .....282	Klenk, Eugene L. ....264, 286
Justman, Daniel .....266, 289	Kaye, Gordon I. ....271, 285, 295	Klepak, Daniel .....293
Jutkowitz, Arnold S. ....302	Keating, Jr., John H. ....281	Klinck, Inez E. ....270, 271
	Keenan, Richard .....277	Kline, Nathan .....290
Kabat, Elvin A. ....261, 278, 281	Kehayes, Alexander R. ....258	Kloth, Edward W. ....291
Kacian, Daniel L. ....278, 297	Keill, Ann G. ....266, 289, 290	Klyvert, Marlene .....274, 300
Kadis, Gerald .....268	Keim, Hans-Jorg .....261, 279	Knapp, Philip .....262, 284
Kaelin, Patricia K. ....282	Keim, Hugo A. ....263, 284	Kneeshaw, Muriel F. ....282
Kafer, Joseph E. ....300	Keller, Stephen .....283	Knowles, Daniel .....264
Kahn, Erich J. ....264, 287	Kellerer, Albrecht A. ....293	Knowlton, Abbie I. ....259, 279
Kahn, Norman .....271, 274, 288	Kellet, Anne E. ....282	Knox, W. Graham .....296
Kahn, Raymond A. ....265	Kelley, Margaret A. ....282	Kobritz, Jeanne .....283
Kahn, Willard S. ....291	Kellogg, Marjorie .....294	Koch, Hyman D. ....300
Kaim, Patricia B. ....267, 293	Kelly, Dennis D. ....288	Koch-Weser Peter T. ....294
Kaimakliotis, Elias M. ....260, 279	Kemeny, Mary M. ....268	Koenigsberger, M. Richard
Kalbacher, Joseph E. ....286	Kemp, Harvey G. ....280	262, 281, 286
Kalinich, Lila .....266, 290	Kendall, Forrest E. ....276, 277, 279	Koester, Charles J. ....284
Kaloss, William A. ....287	Kennin, Michael .....291	Kohl, Schuyler G. ....293
Kambolis, Catherine .....285	Kernberg, Otto Friedmann .265, 288	Kohl, Steve .....265
Kanda, Yoshikazu .....279	Kerst, Richard N.	Kohler, Viktoria I. ....301
Kandel, Denise B. ....292	246, 247, 255, 272	Kokic, Olga .....262
Kane, Kendall K. ....286	Kessler, Bruce E. ....261	Kolb, Lawrence C.
Kane, Rosamond .....263, 283	Kessler, Walter R. ....264, 286	246, 247, 265, 271, 272, 288
Kangos, John J. ....264, 286	Kestenbaum, Clarice J. ....265, 291	Kolody, John T. ....293
Kanick, Virginia .....294	Ketover, Bart T. ....263	Komma, Donald J. ....278
Kantor, Shepard J. ....266, 290	Keyser, John J. ....268	Kopeloff, Lenore M. ....288
Kanzler, Maureen B. ....288	Khalaf, Sahail .....262	Kopff, Jr., Richard G. ....291
Kao, Chien-Kuo .....259	Khambatta, Hoshang J. ....258, 277	Koplon, Burton S. ....259, 278
Kapit, Hanna E. ....290	Khahoo, Yusaf M. ....287	Kornfeld, Donald S.
Kaplan, David .....274, 300	Khanna, Shyam M. ....285	265, 270, 271, 288
Kaplan, Jacob I. ....301	Kiang, Selina C. ....278	Kosinski, Edward J. ....261
Kaplan, Milton M. ....284	Kida, Kaichi .....279	Kosinski, John F. ....300
Kaplan, Neal L. ....302	Kiernan, Howard A. ....263	Koss, Michael N. ....265
Karanas, Arthur .....280	Kietzman, Mitchell L. ....289	Koster, Seymour .....301
Karel, Irving A. ....302	Kilcoyne, Margaret M. ....260, 280	Kovach, John S. ....259, 278
Karelitz-Karry, Marie .....259	Killian, Paul .....260, 280	Kovarsky, Abraham C. ....263, 284
Karis, Joannes H. ....258, 270, 277	Kim, Bang Mo .....295	Kowarski, Szloma .....288
Karkas, John D. ....277	Kim, Hie Chul .....261	Kozam, Robert L. ....260, 279
Karl, William F. ....277	Kim, Ronald C. ....264	Krajewski, Pauline .....282
Karlan, Frances R. ....302	Kimball, Annetta J. ....280	Kramer, Fred R. ....278
Karlan, Marc .....263	Kimmey, James R. ....292	Kramer, Jeffrey .....291
Karlin, Arthur .....281, 288	King, Donald L. ....267, 271, 293	Krasna, Alvin I. ....271, 277
Karmioli, Mortimer .....302	King, Donald W.	Kremzner, Leon T. ....281
Karron, Betty .....266	246, 264, 271, 272, 273, 274, 285	Kreps, Sharon .....267
Karshan, Maxwell .....276	King, Marvin B. ....301	Krieger, Paul A. ....264
Karush, Aaron .....265, 288	King, Mary E. ....285	Krisiloff, Milton .....268
Katis, James G. ....266, 290	King, Thomas C. ....267, 272, 295	Kritchman, David M. ....301
Katsampes, Chris P. ....264, 286	Kinney, John M. ....267, 295	Kritzler, Robert A. ....259, 279
Katz, George M. ....281	Kinzel, Augustus F. ....290	Kroll, Jeffrey J. ....259
Katz, Lawrence .....263	Kiriakopoulos, George .....301	Krongrad, Ehud .....264, 286
Katz, Michael	Kirschner, Corinne .....292	Krooth, Robert S. ....259, 271, 278
246, 264, 266, 271, 291, 297	Kirsten, Edward B. ....288	Krumerman, Martin S. ....286
Katz, Norman S. ....265, 287	Kisic, Alemka .....277, 289	Kufe, Donald .....278
Katz, Solomon L. ....301	Kister, Sven J. ....267, 295	Kulkarni, Mohan H. ....258
Katz, Stephen R. ....302	Kitchin, David .....279	Kull, Christine A. ....265
Katz, Steven E. ....290	Kittridge, Richard D. ....294	Kulsakdinum, Chairat .....264
Katz, Vivienne .....294	Kiyasu, John T. ....286	Kumler, Fern R. ....282
Katzman, Merle H. ....263, 284	Klagobrun, Samuel C. ....291	Kuo, Betty C. M. L. ....265, 287
Kaufman, Herman .....277, 289	Klass, Stephen C. ....262	Kuo, Chen-Jen .....258

	PAGE		PAGE		PAGE
Kuo, Nicetas H.	292	Lee, In Soo	258	Lin, Frank M.	25
Kupersmith, Joel	260, 288, 295	Lee, Mary M. L.	276	Lind, John K.	259, 30
Kupferman, Irving	288	Lee, Milton	290	Lindenbaum, John	260, 28
Kutner, Philip	301	Lee, Wei-Li S.	258, 278	Lindig, George F.	30
Kutscher, Austin H. .	259, 273, 302	Lee, William M.	260	Lindo, J. Trevor	29
Labow, Theodore A.	259, 278	Lee Woon Soon	291	Linz, Andrew M.	274, 30
Ladany, Shoshany	283	Lefer, Leon	266, 289	Lipman, Marvin M.	260, 27
Laderman, Peter	265, 289	Lefkowitz, Nathan	292	Lipow, Walter I.	30
Ladopoulos, Constantine P. .	260, 279	Legato, Marianne J.	260, 280	Lipper, Evelyn	26
Lai, Jenq-Min	258	Lehrer, Richard	302	Lippman, Violet	28
Laidlaw, Arthur E.	287	Lell, Mary Elizabeth	262	Lipson, Diane	26
Laine, Saidel	259	Leidy, Grace A.	287	Lipton, Brian P.	29
Lam, George F.	278	Leifer, Edgar	259, 278	Lipton, James A.	30
Lamartiniere, Coral A.	283	Leiter, Naomi	266, 289	Lisio, Arnold L.	260, 27
Lamb, Jr., Albert R. .	259, 271, 279	Leland, James L.	259	Lissenden, Carolkay	265, 28
Lamb, Charles W.	289	Lenke, Roger B.	262	List, Theodore A.	26
Lambert, Adrian	296	Lennon, Jr., Arthur J.	260, 281	Littler, J. William	29
Lambert, Clark	264	Lennon, Eara M.	282	Lituchy, Stanley	266, 28
Lambert, Jr., Samuel W.	259	Lennon, Richard G.	263, 284	Liu, Hilda H. C.	27
Lambert, John P.	265, 288	Lenz, Maurice	258	Livingston, Peter A.	267, 29
Lamola, Angelo A.	278	Leon, Guillermo	258	LiVolsi, Virginia	26
LaMotte, Peter	263	Lerner, Burton A.	266, 289, 297	Lloyd, Kenneth O.	277, 27
Landau, Stanley J.	268, 296	Lerner, Roger L.	260, 279	Lodyjensky, Catherine	28
Landau, Tamar	297	LeRoy, E. Carwile	260, 278	Loeb, John N.	260, 27
Lane, Frederick	289	L'Esperance, Jr., Francis A. .	263, 284	Loewenstein, Regina	271, 27
Lane, Nathan	264, 285, 295	Lessar, Ronald P.	266	Logan, Barbara J.	28
Lang, Catharine I.	279	Lesse, Stanley	261, 282	LoGerfo, Paul	267, 29
Lang, Enid	266	Lesser, Stanley R.	288	Lohmann, Melvina J.	28
Lang, Peter	265	Levay, Alexander	265, 289	Lombardo, Peter C.	259, 27
Langer, Burton	301	Levenbrown, Jack	267	Lomeo, Alberto M.	28
Langer, Edith Joan	280	Levene, Howard	278	Lonesome, Ronald B.	29
Langford, William S.	258, 276	Levin, Matthew D.	300	Long, Calvin	29
Langner, Thomas S.	291	Levine, Eugene M.	300	Long, Margaret E.	28
Lantzounis, Leonidas A.	263	Levine, Jacob	293	Longo, Frank W.	268, 271, 28
Lapkin, Michael L.	265, 287	Levine, Raphael K.	263	Lopez-Ovejero, Jorge	28
Laragh, John H. .	246, 259, 271, 278	Levinson, Alma	291	Lopyan, Louis	27
Laravuso, Raymond B. .	258, 277	Levinson, Stephen	266, 289	Loreda-Canlas, Anselma C.	28
Larson, Daniel L.	279	Levitt, Lawrence I.	290	Lorenc, Ronald B.	28
Lasoff, Gustave	301	Levy, Henry P.	301	Lorin, Martin I.	264, 272, 28
LaSota, Eugene P.	259, 302	Levy, Joseph S.	261	Loscalzo, Louis J.	259, 30
Lattes, Conrade	267, 296	Levy, Kenneth L.	301	Loutsch, Erica	28
Lattes, Raffaele .	264, 272, 285, 295	Levy, Magda	295	Lovejoy, William P.	260, 27
Lattimer, John K.	246, 247, 268, 271, 272, 296	Levy, Robert L.	258, 276	Lovelace, Robert E.	261, 27
Lauderdale, Jr., Vance	258, 277	Lewis, Jr., John L.	283	Low, Barbara W.	27
Laury, Gabriele V.	266, 289	Lewis, John S.	285	Low, Niels L.	261, 27
Lavietes, Marc H.	261	Lewis, Linda D.	262, 268, 282	Lowman, Cherry L.	28
Lavorgna, Lorenzo S.	265	Lewis, Michael	286	Lowy, Samuel	28
Lawrence, Margaret M.	290	Lewis, Milena L.	280	Lozzi, Virginia	266, 27
Lawrence, Peter F.	268	Lewis, Robert	297	Luban, Joseph	259, 30
Lazar, Norman	265, 289	Lewis, Roger J.	280	Lubarr, Alan	30
Lazaro, Nomenida A.	283	Lewis, Stanley J.	259	Lubart, Joseph	265, 27
Lazarus, George M.	265	Li, Florence	267	Lubin, Martin I.	27
Leahey, Edward B.	284	Li, Lu-Ku	284	Lucca, John J. .	259, 273, 274, 30
Leake, III, Hunter C.	264	Li, Ting I.	281	Luchinsky, Heinz L.	27
Leavitt, Joseph M. .	273, 274, 300	Liben, Florence	266, 289	Luckett, W. Patrick	27
LeBlanc, Wiener	264, 287	Lichaa, Youssef	258	Luhrmann, Jr., George W. .	266, 27
LeBourhis, Elizabeth E.	288	Lichtenberg, Mark S.	259, 278	Luke, Wallace W-K.	27
Lederman, Gerald E.	301	Lieberman, Seymour	277, 296	Lum, Gifford	264, 27
LeDoux, Margaret R. Murray .	276	Liebert, Robert S.	266, 289	Lunn, Joseph S.	27
Lee, Arnold St. J.	277	Liebmman, Max	259	Lutz, Walter G.	267, 27
Lee, Chuck-Kwan	265, 287	Liegner, Leonard M.	294	Lwin, Khin Hnin	27
Lee, Hsin-Chao	258	Lightg, Martha L.	300	Lynch, Hollis R.	27
		Lighter, Gary L.	301	Lynch, Vincent E.	30
		Lin, Chin-Chu	262	Lyons, George V.	30

PAGE	PAGE	PAGE
lythcott, George I. 264, 270, 271, 272, 286	Malm, James R. 246, 267, 295	Mayer, Gerda 281
McAllister, Ferdinand F. 267, 295	Maloney, Milton 293	Mayer, Shirley A. 265, 286
McCabe, Robert E. 296	Maloof, Waleed G. 296	Mayerson, Donald J. 291
McCaffrey, Raymond M. 262, 283	Malouf, Renee 262	Mayrowetz, Burton 261
McCann, Mary B. 297	Malpe, Kavi Raj 294	Mega, Richard S. 263
McCarthy, Elizabeth D. 292	Mancusi-Ungaro, Pier 260, 279	Meier, Werner 265, 287
McClane, Kenneth A. 260, 279	Mandac, Hernani 268	Meineker, Robert L. 291
McClement, John H. 260, 279	Mandel, Irwin D. 259, 273, 274, 302	Meistrell, Jr., Malcolm E. 301
McClennan, Bruce L. 267	Mandel, Louis 259, 273, 301	Mekhjian, Haroutune 295
McColleston, Duncan L. 295	Mandl, Ines 283	Melcher, Jr., George W. 260, 279
McConnell, David J. 260, 271	Manger, William M. 260	Melia, Daniel J. 265, 286
McConville, Jane F. 282	Maniatis, Alice 281	Melicow, Meyer M. 268, 276, 296
McCord, Colin W. 296	Maniatis, George M. 278	Mellana, Frank L. 300
McCormack, Jr., George H. 260, 279	Mankoff, Mark R. 266, 286	Mellin, Gilbert W. 264, 271, 286
McCormick, Floyd W. 292	Manski, Wladyslaw 281, 284	Mellins, Robert B. 264, 286
McCormick, George W. 265	Mansky, Marvin 302	Meltzer, Herbert I. 277, 288
McCormick, Miriam A. 282	Mao, Thomas S. 286	Meltzer, Jay I. 260, 279
McCosker, James P. 302	Maqbool, Sajid 265, 287	Mendelewicz, Julien 289
McCray, Richard S. 281	Marano, Anthony J. 280	Mendelsohn, Frederick S. 289
McDonald, Reynard J. 280	Marantz, Harold 301	Mender, Stephen 302
McDougal, John S. 261	Marbach, Joseph J. 259, 302	Mendleson, Jane I. 282
McEachern, Irene C. 282	Marchand, Anthony 264	Menendez, Carlos E. 261
McElroy, D. Keith 263, 284	Marcus, Eric 266	Meriney, David K. 280
McGill, William J. 270, 273	Marcus, Stuart 290	Merlino, Mario J. 287
McGowan, James M. 291	Marder, Michael Z. 259, 302	Merriam Jr., George R. 247, 262, 268, 284
McHugh, Margaret 265, 287	Marged, E. Joseph 301	Merriam, Walter W. 263
McIlveen, Stephen J. 268	Margolin, Michael M. 262	Merritt, H. Houston 246, 258, 276
McIntosh, Rustin 246, 258, 276	Maricq, Hildegard R. 260, 279	Merritt, Katharine K. 264
McKay, Mary C. 289	Marinovich, Mato L. 260, 279	Mertz, Philip 266, 289
McKinney, Dona E. W. 274, 300	Mark, Lester C. 258, 276	Mesa-Tejada, Ricardo 264
McKinney, John McD 261	Markee, Shirley J. 258, 277	Mesec, Donald F. 290
McLaughlin, Mary C. 293	Markowitz, Alfred M. 267, 295	Meskin, Bonnie B. 289
McLean, Patricia A. 273, 274, 300	Markowitz, Robert 293	Mesnikoff, Alvin 290
McLellan, William L. 285	Marks, Paul A. 259, 270, 271, 272, 273, 278	Messer, Henry D. 281
McMurtry, III, James G. 261, 281	Marley, Catherine A. 263	Messinger, Eli C. 291
McNamee, Mark G. 282	Marolla, Francis A. 292	Messler, Eunice 282
McNicholas, Kathleen W. 268	Marquez, Cecil G. 280	Metcalf, Kenneth M. 265
McNulty, Edward C. 301	Marquit, Bela 263	Mettler, Frederick A. 276
McWhorter, John E. 261	Marsden, David S. 294	Meyer, Karl 276, 277, 279
Macaulay, Cecelia A. 294	Martín, Dean N. 264, 286	Meyer, Michael 279
MacDonald, David M. 291	Martin, Eugene M. 266, 289	Meyers, Donald I. 289
MacDonald, James A. 296	Martin, Josephine D. 290	Meyers, Helen C. 266, 289
MacKay, Mary C. 266, 271	Martindale, Peter C. 266	Meyers, Milton 268
MacKen, Daniel L. 260, 279	Martyn, J. A. Jeevendra 258	Mezza, Alfred J. 301
MacKie, Robert W. 281	Marx, Alvin J. 285	Michels, Robert 265, 271, 272, 288
MacKen, Kevin L. 293	Marx, Herbert J. 279	Michelsen, Christopher B. 263
MacKinnon, Roger 265, 268, 288	Mascia, Armond V. 264, 286	Michelsen, W. Jost 261, 281
MacLean, Neil M. 266, 289	Masland, Mary W. 282, 285	Mignogna, Frank V. 263, 285
MacMillan, Roger W. 268	Masland, Richard L. 261, 281	Milano, Michael R. 266, 290
Maahdik, Sahebarao P. 277	Massa, Enrique 265, 287	Milch, Eli 268
Maahoney, Elizabeth A. 282	Mathers, James A. L. 260, 279	Milch, Peter O. 279
Maier, Herbert C. 267, 295	Mathews, Joan W. 265, 287	Milici, John A. 291
Maier, Nunzio 268	Matis, Jacob D. 280	Miller, Barnett M. 295
Maier, Utpalendu S. 277	Matorin, Susan 290	Miller, Bess I. 292
Malberg, Marc I. 263	Matseoane, Stephen L. 283	Miller, Jr., Donald W. 268
Malfoix, Pamela J. 278	Matsuo, Jishi 280	Miller, Dorothy A. 278
Malik, Krishan 258, 277	Matteo, Richard S. 258, 277	Miller, Douglas 280
Malinowski, Kazimierz C. 284	Mattison, Donald R. 262	Miller, Dulcy B. 292
Malitz, Sidney 246, 265, 288	Mauro, Alexander 282	Miller, J. Lowry 258, 278
Malia, Anantha K. 279	Maurrasse, Corazon 258	Miller, Orlando J. 262, 278, 283
Malinoff, Stuart 262	Mawatari, Shiro 282	Miller, Robert E. 296
Malis, George 261, 279	Max, Martin 268, 295	Miller, Wayne A. 262
	May, Paul S. 293	Miller, William J. 302

	PAGE		PAGE		PAGE
Millet, John A. P.	266	Moyer, Richard	271, 277	Ngai, Shih-Hsun	258, 276
Mills, Donald R.	278, 297	Mudge, Jr., Gilbert H.	261	Ngo, Ignacia	277
Milner, Max	293	Mueller-Heubach, Eberhard A.	262	Nicholas, William M.	280
Milstein, Mona	265	Muir, Keith M.	266	Nichols, Edward A.	287
Mindell, Irwin	300	Mukherjee, Trishit K.	283	Nicholson, John F.	264, 286
Miner, Robert D.	302	Mulcare, Robert J.	295	Niemi, William D.	282
Miner, Walter W.	295	Mulvaney, June Elsie	287	Niinaka, Toru	288
Minervini, George A.	259, 273, 274, 301	Mumford, Robert S.	266	Nikias, Mata K.	292
Minnefor, Anthony B.	264, 286	Munnell, Equinn W.	262, 283	Nikonorow, Andrzej	291
Mintz, Beatrice	292	Munz, Adam	291	Nishihara, Tohru	297
Mintz, Ira L.	289	Muroff, Lawrence R.	267	Nishimura, Hiroko	288
Mitchell, Jr., Walter L.	265, 287	Murphy, Eugene F.	301	Nisonson, Barton	263
Modak, Shanta M.	295	Murphy, Quentin M.	301	Noback, Charles R.	271, 274, 276
Mody, Kokila	264, 286	Murphy, Ramon J.	265	Noble, Robert P.	260, 279
Mohammed, Noel D.	283	Murray, Clarence S.	280	Nocenti, Mero R.	270, 271, 272, 274, 288
Mohr, Irwin	287	Murray, Jeanne B.	282	Norris, Tom R.	263
Mohsen, Ahmed	258	Murty, V. L. N.	277, 284	Norwint, Hanna	267
Moldaver, Joseph	261	Myerberg, David Z.	265	Nos, Jaime	266
Moley, Malcolm	295	Myers, Stanley J.	267, 268, 294	Nosher, Charles	267
Molloy, Joseph A.	295			Noske, Ingrid G.	283
Monahan, David M.	302	Nach, Charles D.	263	Nossel, Hymie L.	246, 259, 272, 278
Mones, Richard L.	265	Nachmansohn, David	276, 277, 282	Nova, Harvey R.	281
Monterrey, Maximo R.	291	Nachumi, Gideon	290	Novick, Lloyd F.	292
Montgomery, James W.	290	Nadler, Lee M.	261	Nute, Jr. William L.	292
Moody, Bobba J.	290	Nag, Moni	291, 297		
Mook, William H.	279	Nagai, Ali H.	258	Oakman, Carl S.	296
Mooney, James	268	Nagler, Jerry	261	O'Brien, John D.	266, 290
Moore, Austin	290	Nahas, Gabriel G.	258, 276	O'Brien, Joseph E.	286
Moore, David B.	262, 283	Nahas, George	274	O'Brien, Joseph L.	261, 282
Moore, Gloria V.	297	Nahoun, Henry I.	259, 273, 301	O'Connell, C. Paul	262
Moore, Richmond L.	258	Naidorf, Irving J.	259, 273, 300	O'Connor, John F.	265, 288, 297
Moore, Sally A.	284	Nakazawa, Hiroshi	285	Odrich, Ronald B.	300
Moore, Thomas J.	287	Nall, Thomas M.	280	O'Grady, George L.	259, 301
Moorjani, Damyanti G.	294	Napoli, Joseph C.	265	O'Hare, Daniel	293
Mora, George	290	Nash, Artemis D.	286	Okamoto, Emi M.	265
Morea, Dennis N.	302	Nastuk, William L.	288	Olichrey, John J.	280
Moreinis, S. Abel	274, 300	Natta, Clayton L.	260, 280	Oliva, Jose	297
Morgan, Councilman	261, 270, 271, 272, 281	Nauen, Richard	293	Oliven, John F.	266
Morgan, Harry	267, 293	Navarro, Carlos	286	Olsen, John E.	295
Morgan, Patricia A.	302	Nay, Howard	296	Ollstein, Ronald N.	295
Morgan, Sylvia	287	Nealis, James G.	265	Oman, Carl R.	258, 300
Morishima, Akira	264, 286	Neer, II, Charles S.	246, 247, 263, 284	O'Neill, Francis J.	290
Morishima, Hisayo O.	277	Neergaard, Arthur E.	260	Oppenheimer, Armand M.	301
Morris, John deL.	294	Nelson, Carl T.	246, 258, 276	Ora-Sarino Milagros	286
Morris, Melvin L.	301	Nelson, William J.	296	Orentlicher, Morton	282
Morris, Thomas Q.	260, 279	Nemes, Gyula	283	Ores, Celia	264, 286
Morrison, Stanley	265, 287	Nemon, William J.	266, 290	Orlin, Harvey	263, 284
Morse, Jane H.	260, 279	Nesi, Roland	259	Ort, Constance B.	282
Morton, Robert F.	295	Nespoli, Grace M.	282	Ortiz-Neu, Carmen	260, 279
Moscarello, Alfred A.	296	Nette, Gerda E.	286	Orzeck, Lida	292
Mosher, Paul W.	289	Nettleton, James	265	Oscoff, Habiv A.	258
Moskow, Bernard S.	301	Netupsky, Morton	301	Oshrain, Herbert I.	302
Moskowitz, Reed C.	266	Neu, Carmen	279	Osler, Geoffrey F.	262, 282
Moss, Hugh MacMillan	263, 284	Neu, Harold C.	260, 271, 272, 279	Osserman, Elliott F.	259, 278, 297
Moss, Leonard M.	266, 289	Neuberg, Hans W.	260	Ostreicher, Herbert P.	301
Moss, Melvin L.	259, 271, 274, 276, 301	Neuhaus, Barbara E.	294	Overholser, Jr., Winfred	266, 289
Moss-Salentijn, Letty	274, 276, 301	Neuhaus, Ralph K.	302	Ovesey, Lionel	288
Moulton, Anthony L.	268	Neuwirth, Robert S.	262, 283, 296	Ozanics, Victoria	284
Moulton, Ruth	289	Newberg, Marc E.	260, 279	Ozdemiv, Elin B.	282
Moumgis, Basil	285	Newman, John H.	261		
Mount, Lester A.	247, 261, 271, 281	Newman, Robert D.	286	Pacella, Bernard L.	265, 290
		Newmark, Michael	262	Pachter, M. Richard	285
		Newton, James C.	284	Pachtman, Harold	267

PAGE	PAGE	PAGE
Pai, Lucille Tsu .....267, 294	Perry, III, Samuel W. ....266, 289	Pool, J. Lawrence ....246, 258, 276
Paidoussi, E. Rea .....266, 289	Person, Ethel .....289	Poole, Jeffrey R. ....267
Painter, Michael .....262	Person, Philip .....274, 301	Poppers, Paul J. ....258, 277
Pakter, Jean .....293	Pertchik, Alan .....262	Porter, Milton R. 247, 255, 267, 272, 295
Palesty, John .....263, 285	Perzin, Karl .....264, 285	Porter, Jr., Robert J. ....268
Palma, Pail A. ....265	Pessar, Linda .....266	Porter, Vincent .....295
Panayotopoulos, Adamandia G. .283	Pestka, Sidney .....285	Portnoy, Stephanie .....289
Pancoast, Stephen J. ....261	Peter, Philip .....261	Poslusny, Elsa .....282
Pandolfo, Frank W. ....300	Peters, Joseph P. ....293	Post, Seymour C. ....266, 289
Pang, Leila M. ....259	Peters, Ruth D. ....265, 287	Postley, John E., Jr. ....260, 279
Pang, Peter K. T. ....288	Peters, Jr., Theodore ....278, 280	Potter, Guy D. ....267, 293
Pang, Rosemary K. ....288	Peterson, Ann S. .260, 270, 271, 279	Potter, Harry R. ....266, 290
Panlilio, Adelisa .....265	Peterson, Barbara A. ....283	Powers, Edward W. ....268
Pantuck, Eugene J. ....258, 271, 277	Peterson, John C. ....302	Prager, Kenneth M. ....260, 279
Papanek, George O. ....271, 291	Peterson, Phillip K. ....261	Prakash, Ajai .....288
Pape, Lawrence G. ....263	Petrie, Roy H. ....262, 283	Prasad, A. L. N. ....282
Paris, Martin .....261	Petti, Michael J. ....260	Presscott, Kathryn F. ....266, 289
Park, Molly H. ....292	Pettit, Helen F. ....271, 282	Presser, Harriet ....271, 291, 297
Park, Sungmin .....265	Phanor, Gilbert .....277	Pressman, Barry D. ....267
Parker, Frieda .....264	Phillips, Gerald B. ....260, 280	Preston, Hugh S. ....277
Parker, Jr., John W. ....295	Phillips, Louise L. ....286	Price, Bruce A. ....292, 293
Parkes, II, James C. ....263, 284	Phillips, Percival B. ....292	Price, Jr., John B. ....267, 295
Parkin, Robert P. ....266, 289	Phillips, Robert A. ....294	Prichard, Elizabeth R. ....279
Parkins, George K. ....268	Phillips, Stephanie .....278	Priebe, Cedric J. ....296
Parks, Thomas J. ....262	Photos, Constantine .....296	Primack, Marshall .....260, 279
Parodi, Edvardo .....268	Pianpiano, Joseph A. ....300	Probst, Theodore D. ....268
Parry, Michael F. ....260	Pico, Jr., Guillermo .....263	Prouty, Richard R. ....280
Parris, Noel F. ....293	Pierson, Anne B. ....262, 283, 297	Provine, Martha M. ....265
Parsa, Mohamed H. ....295	Pierson, Jr., Richard N. ...260, 280	Prudden, John F. ....267, 295
Parshley, Mary S. ....286	Pietri, Raul .....262	Pua, Estella K. ....259
Parson, Narendra .....258	Pilla, Arthur A. ....284	Puchner, Peter J. ....268, 296
Passamanick, Benjamin .....291	Pine, Michael .....261	Pulkrebek, Peter S. ....297
Pascal, Robert .....264, 271, 285	Pines, Jeffrey .....261	Pulrang, Stanford .....268, 296
Pascarelli, Emil J. ....292	Pines, Kermit L. ....260, 278	Putignano, Joseph D. ....296
Pasquariella, Bernard G. ....297	Pinkernell, Bruce .....280	Putney, Frederick B. 270, 271, 272, 292
Patel, Dhun B. ....292	Pinkett, Marcia L. ....292	
Patel, Pravinchandra .....268	Pino, Daniel M. ....258, 277	
Patrick, Jr., Thomas W. 264, 287, 297	Pinpin, Luzviminda .....258	
	Piore, Nora .....291	Quash, Eugene .....295
Patterson, Andrew .....263, 284	Pippenger, Charles E. ....282	Quereshi, Gherlam D. ....261
Patterson, Myron C. ....280	Pirani, Conrad L. ....264, 285	Quest, Donald .....261
Patton, Robert E. ....289	Piro, John D. ....259, 285	Quimby, Edith H. ....276
Paul, Dina D. ....289	Piskacek, Vladimir R. ....290	
Paul, Henry A. ....266	Pi Sunyer, Frances X. .260, 280, 297	Rabinowitz, Herbert .....301
Pava, Yale J. ....300	Pitkin, Olive E. ....293	Rachelson, Morton H. ....265, 287
Pawar, Smitri .....282	Pitman, Gerald H. ....268	Rackow, Herbert .....258, 276
Payne, John A. ....283	Pitt, Jane .....264, 286	Radichevich, Ildiko ....277, 279
Payumo, Carmelino C. ....258	Pizzo, Lawrence J. ....263	Radkowski, Mary Ann .....294
Pedersen, Hilda .....258, 277	Plank, Charles R. ....286	Raebeck, Jr., William .....302
Pellock, John .....262	Pleshette, Michael .....300	Rafferstein, Bernadette .....261
Pedowitz, Walter J. ....263	Poch, Herbert E. ....265, 287	Ragan, Charles A. 246, 247, 259, 271, 272, 278
Peng, Alfred T. C. ....276	Poh, Maureen B. ....259, 278	Rainer, John D. ....265, 288
Penn, Audrey S. ....261, 281	Poillon, William .....281	Rakic, Milovan T. ....260, 279
Penn, Richard D. ....261	Polanco, Altigracia .....277	Ramakrishnan, Rajasekhar ....279
Penner, Joseph A. ....259, 278	Polatin, Alvin H. ....266, 289	Ramirez, Francesco .....278
Pereira, Gerard P. ....270, 271, 276	Polatin, Phillip .....258, 276	Ramos-Bonoan, Carmen ....287
Pereira, Miercio E. Alves ....281	Polin, Richard .....265, 287	Ramsey, Alan G. ....280
Perel, James M. ....289	Polk, Gene A. ....287	Randall, Frederick R. ....267, 295
Perera, Charles A. ....258	Polk, Irwin J. ....287	Rankow, Robin M. ....263, 285
Peretz, David .....266, 289	Pollack, Arthur C. ....262	Ransom, Raymond W. ....290
Perkins, Marvin E. ....288, 293	Pollack, Donald O. ....280	Rapoport, Morris R. ....260, 279
Perl, Louis J. ....267	Pollack, William .....285	Rappaport, Harry .....268
Perlman, Arthur M. ....291	Pons, Jr., Eduardo R. ....260, 279	Rappaport, Sydney C. ....300
Perry, Richard H. ....292, 293	Ponticorvo, Laura .....277	

	PAGE		PAGE		PAGE
Rappleye, Willard C.	276	Rodrigues, Louis	265, 287	Ryan, James H.	265, 288
Rapport, Maurice M.	277, 288	Rodriguez, Jose	261, 279	Ryan, Stephen	286
Raskin, Raymond	290	Rodriquez-Martinez, Frank	265	Ryder, Charles T.	263, 270, 271, 284
Rasweiler, IV, John J.	276	Roels, Dorothy	292		
Raynor, Richard B.	281	Rogatz, Peter	293		
Reagin, Houston R.	300	Rogers, Constance	292, 293	Sachs, Howard	287
Reback, Samuel	261	Roglieri, John L.	260, 279	Sachs, Stephen	262
Recano, Nely Saturno	280	Roizin, Leon	285, 288	Sadler, Elaine B.	261
Redler, Lance D.	284	Romas, Nicholas A.	268, 296	Saenger, Gerhart H.	291
Redmond, Geoffrey P.	265, 287	Romney, Benjamin M.	261	Sagman, David L.	262, 282
Reed, David	266	Rose, Harry M.	246, 258, 281	Sahagian-Edwards, Alex	279
Reemtsma, Keith	246, 267, 271, 272, 295	Rosen, Albert P.	265, 287	Sahler, Otto D.	294
Reese, Algernon B.	258	Rosen, Lawrence S.	277	Saint-Amand, Nathan E.	287
Regalado, Laurencia B.	294	Rosen, Michael R.	288	St. John, Fordyce B.	276
Regan, Ellen F.	263, 271, 284	Rosen, Moshe	286	Salanitire, Ernest	258, 271, 277
Reibaisen, Joseph	276	Rosen, Tove	265, 287	Salcman, Michael	261
Reibel, Stephen P.	266, 289	Rosenbaum, David	262	Salenger, Gary	259
Reichman, Lee B.	280	Rosenbaum, Stanley	261	Salkind, Albert	301
Reiffel, James A.	260	Rosenberg, Arnold	259, 301	Salvatore, Anthony J.	258, 277
Reilly, Edith B.	260, 279	Rosenberg, Stephen N.	293	Salvatore, Joseph E.	284
Reilly, James A.	267, 293	Rosenberger, John W.	266, 290	Salzinger, Kurt	289
Reilly, Kevin B.	262	Rosenberry, Terrone L.	277, 282	Salzinger, Suzanne	289
Reiser, Howard	262	Rosenfeld, Barbara R.	266, 290	Salzman, Leon	290
Reisner, Edward H.	281	Rosenfeld, Eugene D.	292	Samios, Nicholas	266, 289
Reiss, Robert M.	263, 284	Rosenkranz, Herbert S.	281	Sampath, Angus C.	281, 281
Rennert, Morton C.	302	Rosenstein, Bernard	260	Sampson, Phyllis M.	279
Rennie, William R.	263	Rosenstein, Solomon N.	259, 273, 274, 301	Sand, Richard H.	301
Renovitch, Andrea J.	282	Rosensweig, Norton S.	260, 281	Sananman, Michael L.	262, 287
Resnick, Lawrence M.	261	Rosenthal, Mitchell S.	291	Sandelowski, Margarete J.	287
Rettig, Arthur	268	Rosenthal, Sara G.	261	Sanders, Saul L.	259, 268, 271, 271
Reuben, John P.	281	Rosmaita, John S.	264	Sandler, Ben T.	291
Reyes, Rodolfo L.	267, 294	Rosner, William	280	Sane, Paul	267, 291
Reynolds, William V.	285	Ross, Samuel M.	288	Sanger, Bertram J.	261
Reza, Robert J.	261	Rossi, Harald H.	293	Sanger, Grant	267, 291
Rhee, Sang C.	262, 282	Rosso, Pedro	283, 286, 297	Sanger, Sirgay	291
Rheingold, Stephen R.	260, 279	Roth, Joel	264, 286	Santana, Hector B.	261
Rice, Margaret M.	264, 287	Rothenberg, Fred	259, 300	Santise, Roger P.	301
Rice, Robert W.	276, 284	Rothner, David A.	262	Santomauro, Anthony G.	261
Richards, Keith C.	267	Rothstein, Arnold M.	266, 290	Santulli, Robert	261
Richards, Mary R.	265, 287	Rottenberg, Louis A.	267, 293	Santulli, Thomas V.	267, 291
Richards, Roderick C.	264, 287	Roven, Robert B.	260, 281	Sarlin, M. Bruce	266, 291
Richart, Ralph M.	264, 285, 296	Rowland, Lewis P.	246, 247, 261, 271, 272, 281	Saroff, Alan	260, 271
Richter, Ralph W.	261, 282	Roy, Debutta	284	Satran, George	266, 291
Riehle, Jr., Robert A.	268	Royster, Thomas S.	296	Saunders, Hermon	261
Riely, Caroline A.	261	Rozen, Jack H.	259, 278	Saur, David P.	261
Rifkind, Richard A.	259, 271, 278	Rubenstein, Allan	262	Savetsky, Lawrence	263, 281
Rigal-Lizardi, Rene R.	259	Rubenstein, Marc	262	Savidge, G. Paul	261
Ripp, Norbert	300	Rubin, Jeffry F.	263	Savin, Michael B.	301
Risk, Abraham	283	Rubins, Louis I.	302	Savitsky, Elias	281
Rittler, M. Catherine	284	Rubinsztain, Rosalinda	265, 287	Savona, Michael	261
Rivlin, Richard	260, 279, 297	Rudel, Rita G.	281, 288	Sawyer, Wilbur H.	270, 271, 281
Rizkallah, Tawfik H.	283	Rudd, Lucia	287	Scarff, John E.	258, 271
Robbins, Phyllis	266, 290	Rudensky, George	300	Scarff, Timothy B.	261
Roberts, Elliott C.	293	Ruderman, Howard J.	301	Scarola, John M.	301
Roberts, Myron S.	246, 268, 296	Rudin, Leonard	268	Schachter, David	271, 281
Roberts, Theophilus	286	Rudko, Andrew D.	277	Schaeffer, Morris	291
Robertson, Mary M.	282	Rudolph, Michael F.	301	Schaepe, James L.	281
Rocco, Barbara B.	301	Rush, David	264, 286, 292, 297	Schaffeld, Henry G.	281
Rochester, Dudley F.	260, 280	Rusk, Gary	266	Scharer, Lawrence	281
Rodescu, Mauriciu	285	Russell, Maurice V.	293	Scharf, Robert D.	291
Rodgers, James B.	296	Russell, Theresa E.	293	Schauble, James F.	258, 271
Rodgers, John M.	260, 279	Rutschmann, Jacques	288	Schechter, Israel I.	291
Rodgers, Terry C.	266, 289			Scheimberg, Bernardo S.	291
				Schein, Jonah W.	261

PAGE	PAGE	PAGE
Schick, Alfred .....266	Selleck, Nathaniel .....260	Silfen, Daniel W. ....301
Schick, Robert W. ....281	Selman, Abbe J. ....301	Silbey, Robert .....294
Schiff, Robert N. ....302	Seneca, Harry .....268, 296	Sillman, Jane S. ....261
Schiffman, Bernard M. ....293	Senyszyn, John J. ....267	Silston, Stephen .....302
Schiller, Claire .....294	Seplowitz, Alan H. ....261	Silva, Fred G. ....264
Schimpeler, Suzanne M. ....282	Severinghaus, Aura E. ....276	Silva-Hutner, Margarita ..271, 278
Schisa, Esther A. ....292	Sewell, Granville H. ....291	Silver, Carol D. ....261
Schivley, Dora .....282	Shaari-Tehrani, Mehdi ....285	Silverman, Beth .....290
Schlaeger, Ralph G. ....267, 293	Shaderowsky, Lawrence ....290	Silverman, Joseph A. ..264, 271, 287
Schlesinger, Edward B. 246, 261, 271, 281	Shah, Narayan R. ....264, 265, 286	Silvers, Herbert F. ....302
Schmidt, Donald H. ....260, 279	Shahidi, Azra .....281	Silverstein, Ellen F. ....246, 267
Schneider, Jurg A. ....287	Shain, Arthur .....259, 302	Silverstein, Ira .....291
Schneider, Harvey A. ....260, 279	Shainess, Natalie .....290	Silverstein, William H. ....300
Schoener, Eugene P. ....288	Shalita, Alan R. ....259, 278	Simbonis, Stanley S. ....285
Schoenberg, Bernard B. 265, 270, 271, 272, 288, 294	Shalsha, Lilli C. ....266, 290	Simmons, Eldra .....283
Schoenfeld, Harvey .....293	Shanahan, Sheila A. ....265, 287	Simon, Gilbert .....247, 264, 287
Schoenfeld, Helene .....290	Shands, Harley C. ....290	Simon, Jane .....264
Schoenfeldt, Richard S. ....262	Shapiro, Daniel .....288	Simon, Lawrence F. ....296
Schomer, Jesse .....266, 289	Shapiro, Irving S. ....292	Simpson, Elda .....265
Schore, Arthur .....266, 290	Shapiro, John H. ....290	Simpson, George .....290
Schrag, Peter E. ....260, 279	Shapiro, Joseph S. ....259, 278	Simpson, Lance L. ....271, 288, 289
Schrager, Gloria O. ....265, 287	Shapiro, Lewis .....259, 278, 285	Singer, Alfred .....261
Schriever, Henry G. ....285	Shapiro, Robert .....289	Singer, Barry L. ....291
Schroff, Julian .....301	Shapiro, Sam .....293	Singer, Eleanor .....289
Schube, Daniel D. ....259, 301	Sharma, Pradeep .....265, 287	Sinnette, Calvin H. ....287
Schucman, Helen .....288	Sharpe, Lawrence .....289	Sinton, William A. ....263, 284
Schuker, Eleanor S. ....266, 290	Shattan, Boaz M. ....259, 301	Sioussat, Robert S. ....280
Schullinger John N. ..267, 271, 295	Shaver, Joyce C. ....260, 280	Siris, Ethel S. ....261
Schulman, Jay .....290	Shaw, William I. ....294	Siris, Samuel G. ....266
Schulman, Norman .....267	Sheldon, Paul B. ....260	Sirmans, Meredith .....262, 283
Schulze, Bonita P. ....282	Shelley, Edward M. ....266, 290	Sitarz, Anneliese L. ...246, 264, 286
Schulze, Jr., Robert A. ....261	Shelly, Eleanor V. ....294	Skilbred, Lars A. ....263, 284
Schutz, Gunther A. ....297	Shelton, Marvin L. ....263, 284	Skogerson, Lawrence E. ....277
Schvey, Malcolm H. ..263, 271, 285	Shen, Edith .....265, 287	Slanetz, Charles A. ....267, 295
Schwartz, David .....301	Shen, Shih-Change .....276	Slater, Ellen .....267
Schwartz, Herman .....277	Sheng, Kung-Tso .....265, 287	Slater, Lewis M. ....260, 280
Schwartz, Miles J. ....281	Sheps, Jack .....290	Slatkin, Meyer H. ....259, 278
Schwartz, Murray .....259, 301	Sherer, Glenn Keith .....279	Slepian, Jacob Z. ....263
Schwartz, Robert M. ....287	Sherman, Warren T. ....280	Slevin, John J. ....260
Schween, Peter-Heinrich G. ....290	Sherwinter, Julius .....265	Sloan, Lawrence W. ...246, 258, 276
Schwob, Marianne .....287	Shich, Stephanie .....277	Slovio, Thomas .....267
Sciarra, Daniel .....246, 261, 281	Shiller, Jack G. ....264, 287	Smith, Alan DeForest .246, 258,-276
Scrimshaw, Susan .....297	Shim, Yun .....265	Smith, Arthur M. ....268, 296
Scott, Headley .....294	Shimmel, Julia .....297	Smith, David J. ..273, 274, 277, 301
Scrivani, Steven S. ....259, 300	Shimomura, Seiichi .....281	Smith, David M. ....263, 284
Scudder, John .....267	Sholem, Steven L. ....268	Smith, Frank R. ....260, 279
Sealey, Jean E. ....279	Shookoff, Howard B. ....260, 291	Smith, Gilbert P. ....258, 300
Seaman, William B. 246, 266, 271, 272, 293	Shortridge, Lillie M. ....282	Smith, Jeanne A. ....280
Searles, Harold F. ....290	Shostak, Michael .....266, 290	Smith, John E. ....279
Sebrell, William H. ...276, 293, 297	Sian, Corazon S. ....286	Smith, Kendon W. ....266, 289
Seegal, Beatrice C. ....276, 281	Siatong, Winnie B. ....259	Smith, Martin DeForest .....260
Seeland, Irene B. ....266	Sibulkin, David .....259, 278	Smith, Mary V. ....282
Seegal, Martin E. ....293	Sicherman, Hervey .....263	Smith, William H. ....264, 287
Seide, Mathieu A. ....286	Siegal, Charles .....266, 289	Smith, William M. ....277
Seidel, Albin R. ....258	Siegel, Harriet A. ....265	Snow, William B. ....258, 276
Seiden, Margaret R. ....261, 282	Siegel, Israel .....281	Snyder, Arthur I. ....260, 279
Seigel, Morton D. ....290	Siegel, Kenneth L. ....302	Snyder, Joseph E. ....255, 293
Seibst, Paul L. ....292	Siegel, Morton R. ....293	Snyder, Perrin B. ....296
Sejendy, Balazs .....283	Siegmán, Athilia E. ....292	Snyder, Ralph W. ....285
Self, Edward B. ....255, 267, 295	Sigelman, Jesse .....263	Sobel, Harold J. ....285
Seigman, Morton J. ....265, 287	Sikes, Ralph F. ....293	Solomon, Charles S. ....300
	Silbermann, Maximilian .....261	Solomon, Marvin .....302
	Silbert, Paul J. ....262	Sommer, William G. ....291
	Silbert, Robert .....289	Sommers, Sheldon C. ....285

	PAGE		PAGE		PAGE
Sorabella, Philip	267	Sterling, Kenneth	260, 280	Szmarag, Ruth	266, 289
Sorger, Martin L.	263, 284	Stern, Aaron	289	Szmunn, Wolf	292
Soricelli, David A.	300	Stern, Daniel N.	266		
Soriero, Olive	262	Stern, David	289	Tabor, Edward	265
Sotelo, Julio E.	260, 279	Stern, Lenore O.	297	Taggart, John V.	259, 271, 273, 278, 288
Sotiropoulos, Alexander	268	Stern, Morton J.	259, 301	Talarico, Rudolph D.	296
Sours, John A.	266, 289	Steuer, Irwin	301	Talbott, John A.	290
Southam, Anna L.	283	Stevens, Lawrence E.	267, 296	Talbott, Kristen H.	302
Southern, Darrell L.	265	Stevenson, Stuart S.	264	Talwar, Prem	297
Southworth, Hamilton	246, 258, 279	Stewart, David W.	293	Tamir, Hadassah	277, 289
Spady, Frieda H.	266, 290	Stiles, David	265, 287	Tamlyn, Thomas T.	281
Spain, David	286	Stinchfield, Frank E.	246, 247, 263, 271, 272, 284	Tannenbaum, Myron	264, 285, 296
Spalding, Charles F.	290	Stitt, Harold	294	Tannenbaum, Paul J.	302
Spalter, Harold	263, 284	Stock, Richard J.	260, 271, 279	Tantibhedhyangkul, Phienvit	287
Sparks, Carlton A.	300	Stoeckle, David B.	268	Tapley, Donald F.	246, 247, 259, 270, 271, 272, 278
Speck, William T.	265	Stokman, Cornelis L.	289	Tarcia, Carol R.	292
Spector, Sidney	277, 287	Stoll, Frances A.	300	Tardo, Carmela	262
Spedaliere, Carmine	283	Stolnacke, Richard A.	293	Tardy, Walter	266
Speert, Harold	262, 283	Stone, J. Gilbert	258, 277	Tarlov, I. M.	282
Speigel, Richard M.	267	Stone, Michael H.	266, 289	Tarshis, Julius	301
Speller, Marsha	266	Stone, Robert	295	Tator, Robert B.	280
Sperry, Warren M.	276	Storch, Marcia L.	283	Taxin, Richard N.	267
Spiegel, Herbert	265, 288	Straker, Hilda G.	259, 278	Taylor, Jr., Howard C.	246, 258, 276
Spiegelman, Sol	271, 278, 297	Strauss, Raymond B.	263, 285	Taylor, Lawrence E.	295
Spitz, Henry I.	266, 291	Strauss, Robert A.	264	Taylor, Reginald	289
Spitzer, Robert	288	Stravrianopoulos, Joannis G.	277	Teng, Clarence	292
Spodek, Marvin	302	Stricks, John	259	Tennyson, Virginia M.	285
Spotnitz, Henry	268	Strife, II, Peter H.	302	Terada, Masaaki	278
Sprague, David H.	259	Strika, Gerda H.	266	Terenzio, Joseph V.	271, 291
Sprinson, David B.	277	Stroh, Edward	274, 301	Terenzio, Peter B.	271, 301
Sprunt, Katherine	264, 286	Stromberg, Kurt	264	Terestman, Nettie	289
Srinivasan, Balachandran	263, 284	Struening, Elmer L.	291	Terry, Jr., James H.	296
Srinivasan, Dorothy	277	Stuart, John C.	263	Terzakis, John A.	285
Srinivasan, Parithychery R.	271, 272, 277	Stumpf, Harry H.	285	Thetford, William N.	288
Srole, Leo	288	Stutzman, Vernon C.	293	Thieman, Philip W.	295
Srou, Raja K.	268	Suarez, Ester S.	283	Thomas, III, Henry M.	260, 279
Stahl, Eva B.	259, 278	Subramaniam, Arambi P.	296	Thomas, Samuel F.	261, 280
Stahl, Theodore J.	260, 279	Suciu-Foch, Nicole	285, 295	Thomas, Jr., William C.	291
Stallone, Frank	290	Suh, Han Kyu	261	Thompson, Errol A.	285
Stanek, Albert	264	Sullivan, Stuart F.	277	Thompson, Peyton	266
Stankewick, Walter R.	265, 287	Sum, Grace C. K.	290	Thomson, Gerald E.	260, 271, 280
Stanley-Brown, Edward G.	296	Sung, Duk II	267	Thorne, Irving J.	295
Stanton, Robert A.	268	Surer, Fouad	283	Thorne, Richard E.	246, 261
Stark, Raymond	265, 287	Sutherland, Imende	267	Thornhill, Herbert L.	267, 271, 294
Stark, Richard B.	296	Susser, Mervyn W.	291, 297	Thurston, Herbert	261
Stassa, George	294	Sutter, David B.	261	Thyng, Frederick	267
Stearns, William H.	260	Sutton, Samuel	288	Tien, Shih-Hui	259
Steeg, Carl N.	264, 286	Svahn, David S.	280	Tierney, Mary B.	265
Steer, Charles M.	247, 262, 283	Swana, Fidel	266	Tietjen, George W.	268
Steibel, William	300	Swann, Alan C.	261	Tietze, Christopher	283
Stein, Anna	283	Swarm, Richard L.	285	Tobin, Michael	289
Stein, Arthur	266, 289	Sweeney, Eugene W.	259, 278	Todd, Caron	292
Stein, Jeffrey	260, 279	Sweeney, Sister Margaret M.	293	Todd, James S.	267, 295
Stein, Sanford	266, 289	Sweeting, Joseph G.	260, 270, 271, 279	Todd, W. Duane	246, 262, 283
Stein, Stephen D.	302	Swordloff, Bluma	288	Tokumaru, Tadasu	281, 284
Stein, Zena A.	291	Swordlow, Paul H.	281	Tomashefsky, Philip	285, 296
Steinberg, Sidney	282	Swift, Lucy H.	264, 287	Tonndorf, Juergen	284
Steiner, Alfred	260, 278	Symonds, Jr., Francis C.	267, 271, 295	Toran-Allerand C. Dominique	297
Steiner, Jerome	266, 289	Syracuse, Donald C.	268	Tornusciolo, Alfonso	266
Steiner, Nicholas V.	280	Szabo, Nicholas A.	261	Totero, Nestor J.	291
Steinglass, Kenneth M.	268	Szalita, Albert B.	288	Touriel, Albert T.	268
Stember, Rishon	266, 290				
Stent, Theodore R.	294				

PAGE	PAGE	PAGE
Tovell, Harold M. M. ....283	Vesikari, Timo .....287	Weider, Arthur .....290
Townsend, Eleanor B. ....293	Vestergaard, Per B. ....290	Weidinger, Peter .....261
Tozzo, Pellegrino J. ....296	Vicale, Carmine T. ....261, 281	Weil, III, Richard .....267, 295
Tracht, Myron E. ....285	Vicens, Cristobal A. ....260, 279	Weill, Cheryl L. ....282
Trei, Alice R. ....294	Viederman, Milton .....266, 289	Weinberg, Barry M. ....300
Tretter, Patricia .....267, 293	Villafuerta, Aurora D. ....282	Weinberg, Daniel .....288
Tretter, Wolfgang .....262, 283	Villaluz, Carmen M. ....259	Weinberg, Harvey .....259, 278
Triner, Lubos .....277	Villamon, Luis F. ....261	Weinberg, Harvey I. ....259
Tripi, Joseph E. ....268	Villanueva, Rey O. ....259	Weidenbacher, Richard L. ....266
Trocha, Paul J. ....277	Vinci, Joseph M. ....261	Weinberger, David S. ....291
Trokell, Stephen L. ....263, 284	Vinkka, Heli .....301	Weiner, Louis .....293
Truccone, Nestor .....265, 287	Viola, Michael V. ....297	Weinstein, Ephraim .....302
Tschopp, Thomas B. ....280	Viprakasit, Dejo .....268	Weinstein, I. Bernard
Tucek, Charles O. ....290	Vita, Martin B. ....264, 287	260, 272, 278, 297
Tuchman, Walter .....290	Vitikainen, Kari .....268	Weinstein, Joel D. ....263, 284
Tuckman, Alan J. ....290	Vogel, Henry J. ....281, 285	Weintraub, Gerald .....280
Tueting, Patricia A. ....290	Vogel, Howard B. ....300	Weis, Lawrence D. ....263
Turgeon, Livia K. ....292	Vogel, Ruth H. ....285	Weissberg, Leon .....262
Turino, Gerard M. ....259, 278	Vogl, Thomas P. ....293	Weiss, Allen S. ....261
Turkel, Ann .....289	Von Bockstiele, Piere G. ....295	Weiss, Arthur B. ....302
Turnauer, Elizabeth F. ....265, 287	Von Bulow, Barbara C. ....290	Weiss, Benjamin .....277, 289
Turner, Naomi L. ....267, 294	von Hofe, Frederick H. ....264	Weiss, Harvey J. ....280
Tuul, Aino .....277	von Micsky, Lajos I. ....283	Weiss, Jay .....302
Tyson, Cornelius J. ....260, 279	Voorhees, Jr., Arthur B.	Weiss, Melvin B. ....260, 279
Tytun, Alex .....292	246, 267, 271, 295	Weiss, Richard W. ....266
Uccellani, Ennio L. ....259, 273, 302	Vosburgh, Gilbert J.	Weiss, Robert M. ....288
Udel, Melvin M. ....291	262, 270, 271, 283	Weissbach, Arthur .....278
Udenfriend, Sidney .....278	Vratsanos, Spyros M. ....281, 302	Weissbach, Herbert .....278
Ufford, Elizabeth .....264, 287	Vulliemoz, Yvonne .....277	Weissberg, Josef H. ....266, 289
Ulan, Martin S. ....293	Wagner, Bernard M. ....285	Weissman, Kenneth .....262
Umhey, Jr., Charles E. ....268, 296	Waldes, John .....302	Weitzen, Hyman G. ....261, 282
Umhey, James A. ....268	Waldron, Robert L. ....267	Weld, Francis M. ....261
Unchalipongse, Pisan .....283	Walker, Thornton S. ....280	Wells, Winfield J. ....268
Underbrink, Alan G. ....293	Wallace, Robert E. ....292	Welsch, Exie E. ....266, 289
Untereker, John J. ....294	Wallach, Ronald .....261	Werne, Benjamin .....293
Urm, Elo .....286	Waller, Riely W. ....283	Wermer, Paul .....260
Usami, Shunichi .....288	Walsh, Robert F. ....302	Wermer, Benjamin .....293
Uson, Aurelio C. ....268, 296	Walter, Joseph F. ....267	Werner, Sidney C. ....259, 278
Van Alstine, Helen .....260, 279	Waltner, Jules G. ....263, 284	Wertheim, Arthur R. ....259, 271, 278
Van Alstine, Susana L. ....290	Walzer, Richard A. ....259, 278	Wertlake, Paul T. ....285
Van Der May, Lawrence J. ....291	Wandel, Thaddeus L. ....263, 284	Wessinger, James B. ....263
Vande Wiele, Raymond L.	Wang, Chung C. ....292	West, John P. ....296
246, 247, 262, 271, 272, 283, 296, 297	Wang, Hsueh-Hwa .....288	Westerhoff, Jr., Peter D. ....263, 285
Van Dyke, Frank W. ....291	Wang, Shih-Chun .....287	Wethers, Doris L. ....264, 287
Van Etten, Royal C. ....258	Warburton, Dorothy .....278	Wharton, Ralph N. ....266, 289
Van Itallie, Theodore B. ....260, 280	Ward, Joseph N. ....296	Wheat, William D. ....291
Van Ness, Edward H. ....293	Warren, Lucy D. ....282	Wheaton, Jr., Earl A. ....260, 279
Van Itallie, Theodore B. ....271, 297	Washio, Hiroshi .....296	Wheeler, Edward M. ....284
Van Praagh, Ian G. ....283	Wasserman, Bernard H. ....301	Wheeler, Maynard C. ....258, 276
Varma, Andre A. O. ....291	Wassermann, Norbert .....281	Wheeler, Robert C. ....265, 287
Varoscak, John R. ....302	Watkins, Elizabeth B. ....264, 287	Whetsell, William .....264
Vastola, James W. ....296	Watkins, Melvin B. ....263	White, Geoffrey G. ....263
Vaughan, Jr., E. Darracott .....261	Watson, Benjamin P. ....246, 258, 276	White, John J. ....296
Vaules, David W. ....280	Watson-Walters, Kathleen .....267	White, III, Robert R. ....296
Veenema, Ralph J. ....268, 271, 296	Wax, Sandor H. ....268, 296	Whitfield, Stanley .....285
Veitch, Sidney .....259	Weber, Anne-Marie .....264	Whitlock, Robert T. ....260, 279
Veprak, Leos G. ....297	Weber, Collin J. ....268	Whitman, Clifford LeR. ....301
Verdisco, Loretta .....282	Weber, John J. ....288	Whittemore, Anthony .....268
Verlin, William A. ....301	Webster, Jerome P. ....258, 276	Whitten, William W. ....265, 287
Vero, Sr., Nicholas A. ....302	Wechsler, Michael .....268	Whittier, John R. ....290
Vero, Jr., Nicholas A. ....302	Weekes, Francis .....277	Whichern, Walter A. ....271, 295
Verosky, Mariagnes .....277	Weekes, Noel .....286	Wickham, Robert D. ....296
	Wei, Wellington .....267	Wickremesinghe, Anthony E. ....258
		Widner, Geraldine A. ....293

	PAGE		PAGE		PAGE
Widrow, Maxwell	259, 302	Wiseley, Sally	294	Yeoh, Chin Bor	296
Wiedel, Philip D.	267, 271, 272, 295	Wishik, Samuel M.	291	Yergan, Charles M.	280
Wiederhorn, A. Roger	268	Wit, Andrew L.	288	Yergan, Jr., Max	295
Wigger, H. Joachim	264, 285	Witkovsky, Paul	284, 288	Yordan, Jr., Edgardo L.	262
Wightman, Mark A.	259	Witowski, John J.	267	Young, Jr., Alexander W.	259, 271, 278
Wilcox, Daniel A.	265	Wittenborn, John R.	265	Young, Estelle I.	259
Wilcox, Jr., Herbert B.	260	Wittes, Janet	292	Young, James S.	273
Wilder, David	289	Wolarsky, Evan V.	268	Young, Stuart H.	260
Wildman, Joseph M.	261	Wolf, Abner	258, 276, 286	Yu, Ming Tsung	278
Wilens, Sigmund L.	258	Wolf, Charles E.	258	Yudelman, Ian M.	261, 279
Wiley, Bruce E.	267, 293	Wolfe, Samuel	293	Yudofsky, Stuart C.	266
Wilkie, George H.	266, 289	Wolfers, David	297	Yuc, Shyh-Jong	267, 294
Wilking, Leo, F. J.	264, 287	Wolff, James A.	246, 264, 271, 286		
Wilking, Virginia N.	290	Wolff, Marianne	264, 285, 295		
Willets, Arthur T.	268, 296	Wollesen, Fleming	283	Zakhary, Reda A.	259
Williams, Alfred J.	283	Wolmer, David H.	301	Zanes, Anne S.	292
Williams, Arthur C.	293	Won, Il Sung	259	Zaslow, Leonard	302
Williams, Daniel	266	Wood, Ernest H.	267, 293	Zdibak, Elizabeth B.	282
Williams, Gail S.	260, 279	Wood, John A.	260, 279	Zegarelli, David J.	259, 285, 302
Williams, Herbert	300	Woodcock, Thomas M.	261	Zegarelli, Edward V.	246, 259, 271, 273, 274, 302
Williams, Michael D.	280	Woodman, DeGraaf	258	Zeidenberg, Philip	266, 289
Williams, Roger W.	291	Worlund, Richard L.	263	Zeisler, David	302
Williamson, Susan W.	262, 268, 283	Wotman, Stephen	273, 302	Zelko, Russell R.	263
Wilson, Nicholas J.	289	Wray, Edwin O.	282	Zengo, Albert	273, 302
Wilner, George D.	285	Wright, Myron	281	Zerden, Edward	302
Wilson, Agnes G.	264	Wu, John C.	286	Ziffer, Herman	280
Wilson, Frank R.	262	Wu, Ruey R.	294	Zikria, Bashir A.	267, 271, 295
Wimsatt, Michael	268	Wung, Jen Tien	259	Zimberg, Sheldon	290
Winbury, Martin M.	288	Wylie, Robert H.	258	Zimmering, Paula	277, 283
Windrow, Mary E.	246, 255, 282	Wynder, Ernest L.	291	Zimmerman, Earl A.	262, 282, 297
Windsor, Charles	271			Zinser, Hans H.	268, 296
Winick, Myron	264, 271, 286, 297	Yaffee, Lynn J.	264	Zipper, Howard D.	263, 285
Winikus, Winifred	288	Yahr, Melvin D.	261	Ziring, Philip R.	264, 287
Winner, Samuel D.	296	Yamaguchi, Nobuo	297	Zitzmann, Eric K.	263, 284
Winslow, T. Scudder	296	Yang, Chen-Ping	259	Zorbis, Andrew	268
Winter, Lynn C.	266	Yang, Joseph	258, 259, 277	Zubin, Joseph	276, 290
Winters, Robert W.	264, 286, 297	Yannopoulos, Kaity	285	Zucker, Preston	264, 287
Wirotko, Emil	263, 284	Yeaw, Ralph C.	268, 296	Zugibe, Frederick T.	285
Wise, Carl R.	247, 255, 260, 272, 279	Yeaw, Scott	268	Zyroff, Jack	267
		Yeh, Ming Neng	262, 283		



1. THE BABIES HOSPITAL
2. BABIES HOSPITAL ADDITION
3. RADIOTHERAPY CENTER
4. THE PRESBYTERIAN HOSPITAL
N. Y. ORTHOPEDIC HOSPITAL
SLDANE HOSPITAL
SQUIER UROLOGICAL CLINIC
5. THE PAULINE A. HARTFORD MEMORIAL CHAPEL
6. THE HARKNESS PAVILION
7. WILLIAM BLACK MEDICAL RESEARCH BUILDING
8. COLLEGE OF PHYSICIANS AND SURGEONS
ALUMNI AUDITORIUM
9. COLLEGE OF PHYSICIANS AND SURGEONS
10. VANDERBILT CLINIC
11. VANDERBILT CLINIC ADDITION
12. DEPARTMENT OF HEALTH
WASHINGTON HEIGHTS
HEALTH CENTER, N. Y. C.
13. THE GEORGIAN NURSES RESIDENCE
14. AUGUSTUS C. LONG LIBRARY-HEALTH SCIENCES
CENTER (Under Construction)
15. BARD HAVEN APARTMENTS
16. BARD HALL MEDICAL STUDENT RESIDENCE
17. THE PSYCHIATRIC INSTITUTE AND HOSPITAL
18. THE NEUROLOGICAL INSTITUTE OF NEW YORK
19. ANNA C. MAXWELL HALL
SCHOOL OF NURSING RESIDENCE
20. CHILDREN'S PLAY AREA
21. TENNIS COURT
22. EDWARD HARKNESS MEMORIAL HALL
23. THE DANA W. ATCHLEY PAVILION
24. THE EDWARD S. HARKNESS EYE INSTITUTE
25. EYE INSTITUTE RESEARCH LABORATORIES
26. SERVICE BUILDING
27. PARKING FACILITIES
28. FRANCIS DELAFIELD HOSPITAL



COLUMBIA UNIVERSITY LIBRARIES



0050075020

